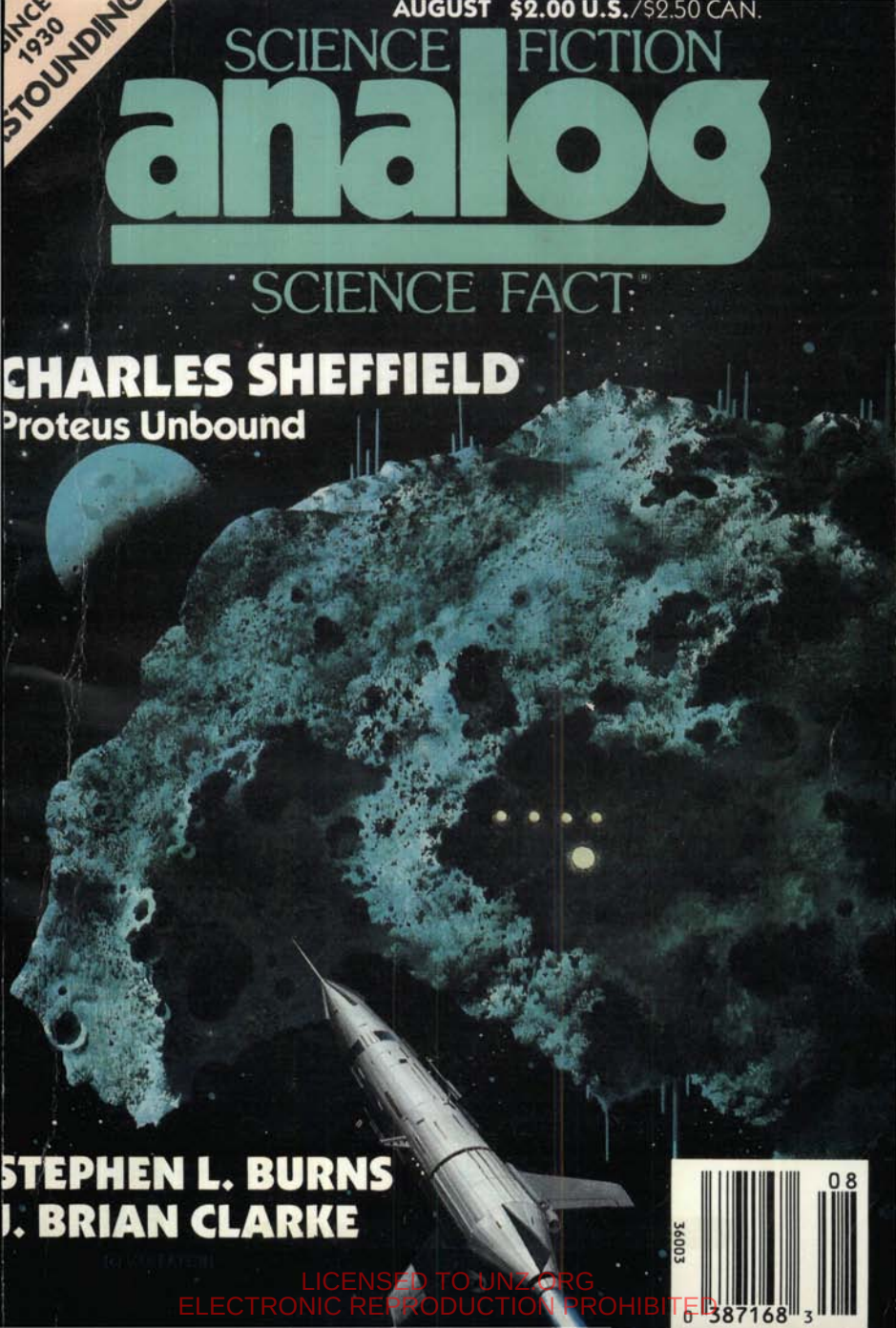

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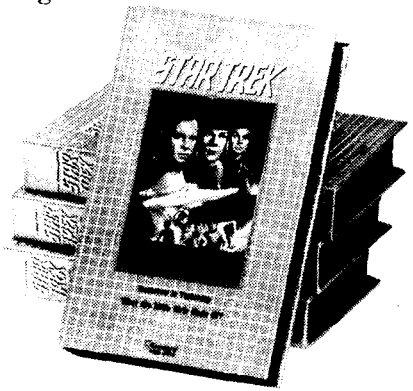

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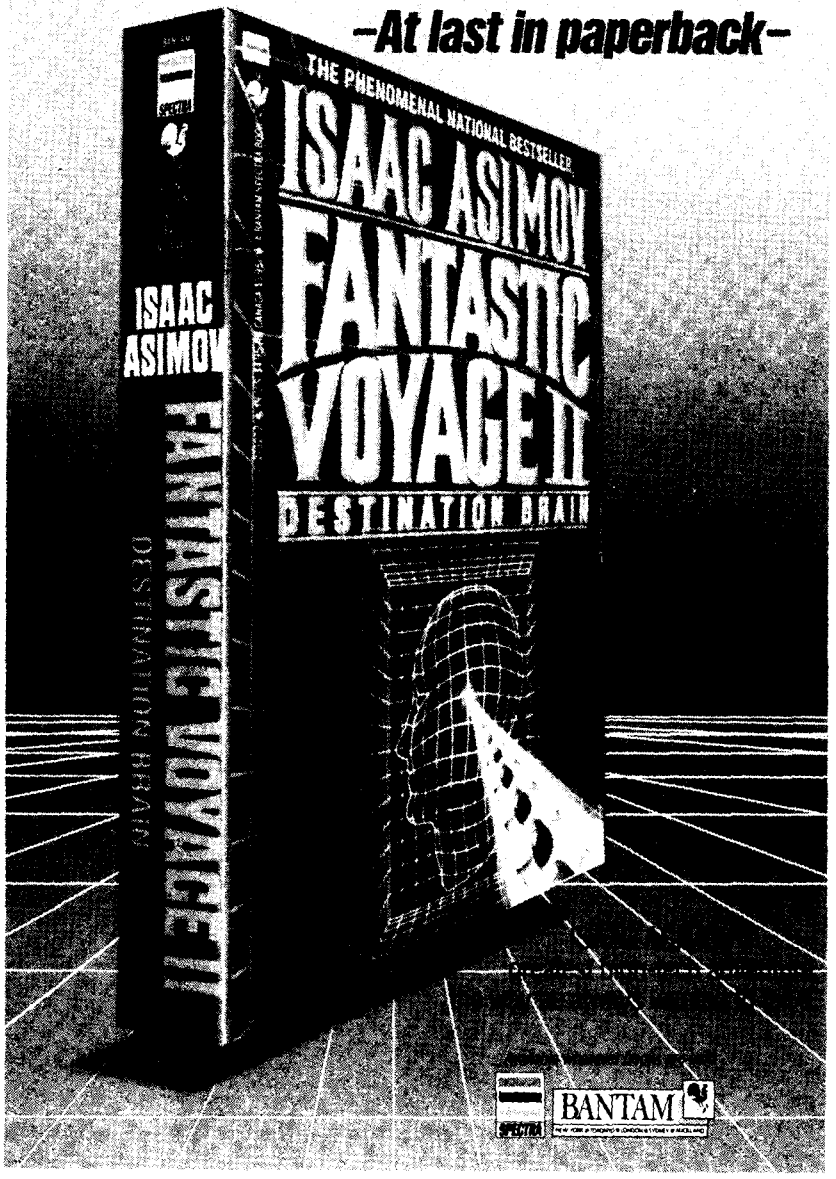

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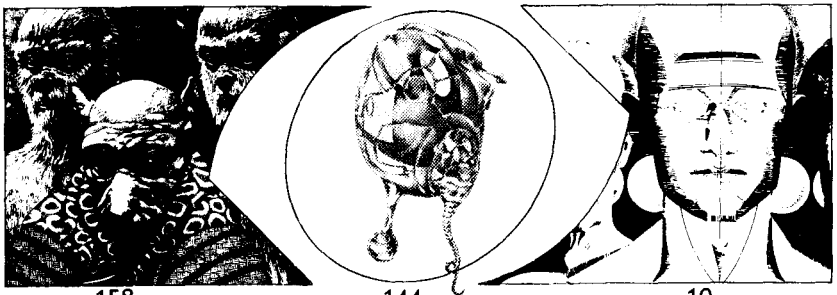

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Editorial

WITH ONE EXCEPTION . . .

Stanley Schmidt

A few months back, I had an editorial here called "Matters of Principle," in which I set forth the idea that while firm principles are often good things to have, excessively rigid adherence to a preformulated principle may sometimes be detrimental. One of the principles I mentioned as an example was the idea that open competition in a free market is the best way to run an economy—and I dared to suggest that some special cases, such as national communication or transportation systems, might be exceptions to that rule. Several readers were profoundly irritated by this suggestion, and told me so in no uncertain terms.

This might be a good time to remind all and sundry of a philosophical principle which has lurked behind *Analog* editorials for as long as I can remember: that virtually any belief or viewpoint is open to question and reexamination. The editor does not necessarily believe everything he writes—but if he really wants to give an idea a fresh examination, he'd better think and write as if he does for the duration. It's wise to keep that in mind while reading any editorial here, and try not to take personal offense if your personal ox gets gored.

As it happens, the value of free enterprise and competition is a principle that I do think has a lot of merit most of the time, though I still plan to resist getting so dogmatically attached to it that I can't conceive of a situation in which something else might be better. As I read over my earlier editorial and some of the indignant responses to it, I found myself thinking that maybe this month I should give the whole thing a different twist. This time I'm going to ask: how strongly do *American businessmen* really believe in free competition?

I suspect you'd be hard put to find

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many who said they *don't* believe in it, but I've seen a good many actions that make me wonder about the words. For instance:

—Ever since moving to New York, I've been amused and bemused by periodic heated arguments over whether or not grocery stores should be allowed to sell wine. Care to guess who's for and who's against?

—I also, from time to time, see items in the New York media about the owners and managers of the big, expensive stores on Fifth Avenue wanting to get pushcarts and other street vendors off the street, claiming they constitute "unfair competition."

—Anybody who ventures out on the streets with his or her eyes open is sure to see bumper stickers saying BUY AMERICAN!, or conveying the same message a bit more subtly and a lot more ironically in such terms as BUY A FOREIGN CAR: PUT TEN AMERICANS OUT OF WORK. Anybody who goes so far as to read the papers with any regularity will encounter demands for various forms of protectionist legislation to control international trade. After all, those furriners are unfair competition, aren't they?

Now seriously, folks, do you really think any of those sound like the words and deeds of people who really, truly, deep down believe in the virtues of free competition?

Or might it be that what many of us *really* believe in is *free competition for everybody except* my *competitors?* That's about the only plausible motive I can see in the wine controversy. New York wine and liquor store operators, not surprisingly, see all sorts of dreadful things happening if groceries are allowed into "their" business—not the least of which is the scary possibility that *they* might be competed out of business. No doubt some of them would. But that's what free enterprise is about, isn't it? Those businesses that keep enough customers satisfied to stay in business, do so. Those that can't, have to find another job. But plenty of people have done that, and plenty more will. One store going out of business and its staff finding other employment does not constitute overall economic disaster. It's quite possible to have a viable economy in which grocery stores sell wine. The idea that it doesn't seems quite ludicrous to someone who grew up and lived half his life in a state where it's been done all along.

And do the luxury department stores of Manhattan *really* feel threatened by small-time sidewalk vendors out front? I don't think I'll dignify that with further comment.

Those cases, and others like them, all seem to me to be cases of individual American businesses trying to rationalize legislating selected others out of competition with them—an understandable temptation, if the legal system offers the opportunity, but hardly consistent with the idea that *anybody* should be able to compete to the best of his ability. The BUY AMERICAN situation is a little different, but only in the scale of the participants. Here, the claim is that a foreign country's version of an entire industry (cars, for instance) is in com-

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petition with this country's version of it, and that that competition is unfair because of different economic conditions in the two countries—for example, that the foreign counterpart of an American product can always be sold at a lower price because the foreign labor force will work for less pay than the American. Again, understandable; and, in the short term, true. But wouldn't a real believer in free competition say that the proper American response to that situation would be not to tell the foreigners they can't play any more, but to insist that American companies meet the challenge by finding their own ways to make a better product cheaper? True, foreign companies have an advantage in cheap labor; so let American companies find or create their own advantages to offset that one.

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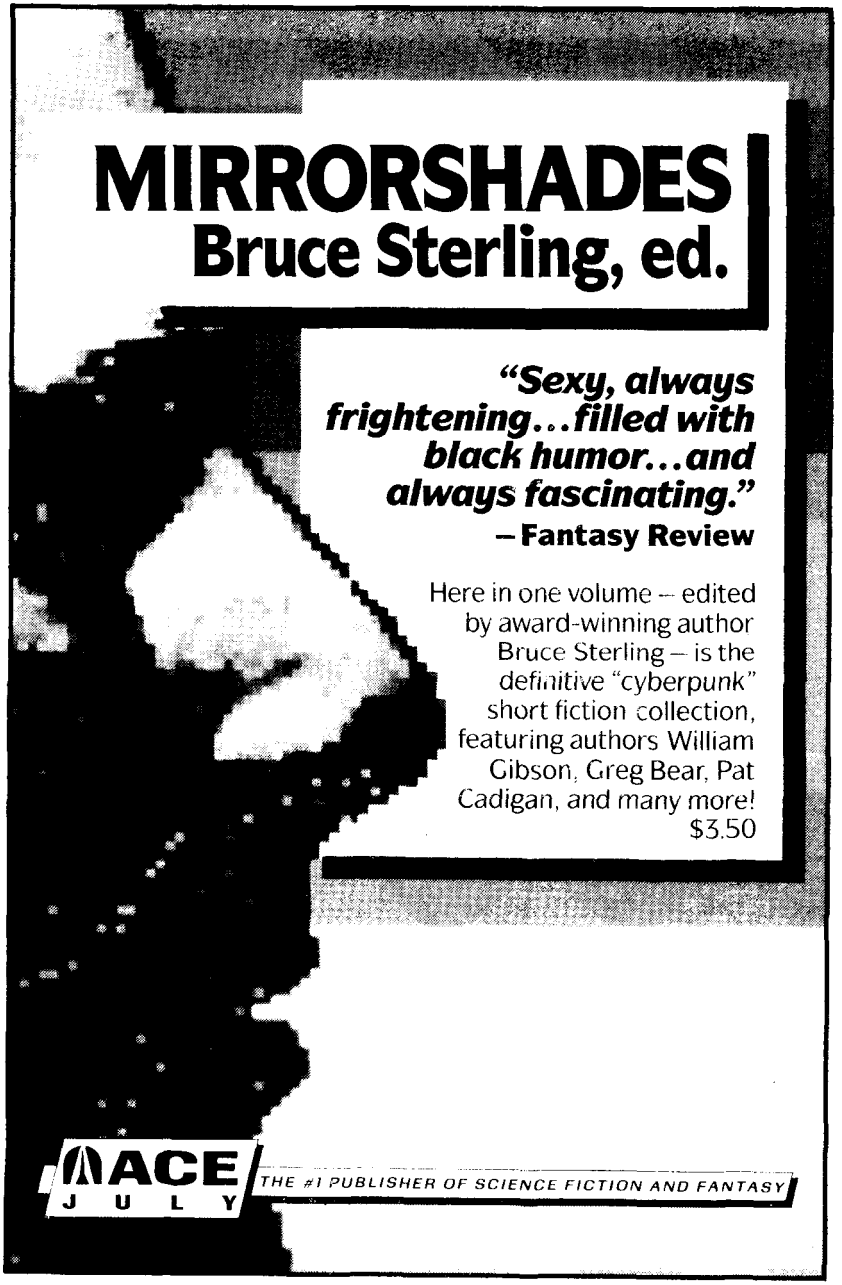
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I have some recent personal experience with this. A few months ago my wife and I were shopping for a car to replace one that we'd had long enough so that it was starting to get tired. What we had in mind was something three or four years old that we could expect to provide solid, reliable transportation with minimal repair time and expense. Other things being equal, we would have had some preference for an American-built car (although since we were looking for a used car, the economic impact of our choice would be less than that of somebody buying a new one). But the *primary* considerations were quality and reliability—and in those areas, it seemed, other things were *far* from equal. One advantage of buying a used car is that the offerings on the market have track records that can be compared (unlike new cars, where you have to rely on somebody's guesses about how something not yet time-tested will hold up). *Consumer Reports* published a feature that did exactly that, analyzing the breakdown and repair histories of a large number of models in considerable detail. The article included a pair of tables on facing pages, one listing particularly good buys (in term of repair records) and the other listing particularly troublesome models better avoided. It was painfully obvious even at first glance that the "good buy" chart was heavily dominated by Japanese names, while most names in the "better avoid" list were American.

The Detroit automakers have been telling us lately that they're doing better now. I hope time will prove that to be true. In the meantime, what should an American consumer who wants the best for both himself and his country do? I respectfully submit that "BUY AMERICAN," if American is shoddy, is at best a short-term solution, and in the long run self-defeating. The customer gets stuck with merchandise that doesn't perform well, and his compatriots are encouraged to keep producing more of the same. In the long run, both individual and country will fare better if he acts as if he *really* believes in free competition, regardless of who's competing. That means buying the best product he can find, regardless of who's selling it. That way he gets better merchandise now, and his own country's manufacturers get a strong incentive to learn how to provide the best, at an affordable price, the next time he's shopping.

In other words, instead of bumper stickers that demand

BUY AMERICAN CARS,

I propose the following:

DEMAND BETTER
AMERICAN CARS!

If enough of us do that, we have a good chance of getting them. And that's to *everybody's* benefit. ■

●If you do not think about the future, you cannot have one.

John Galsworthy

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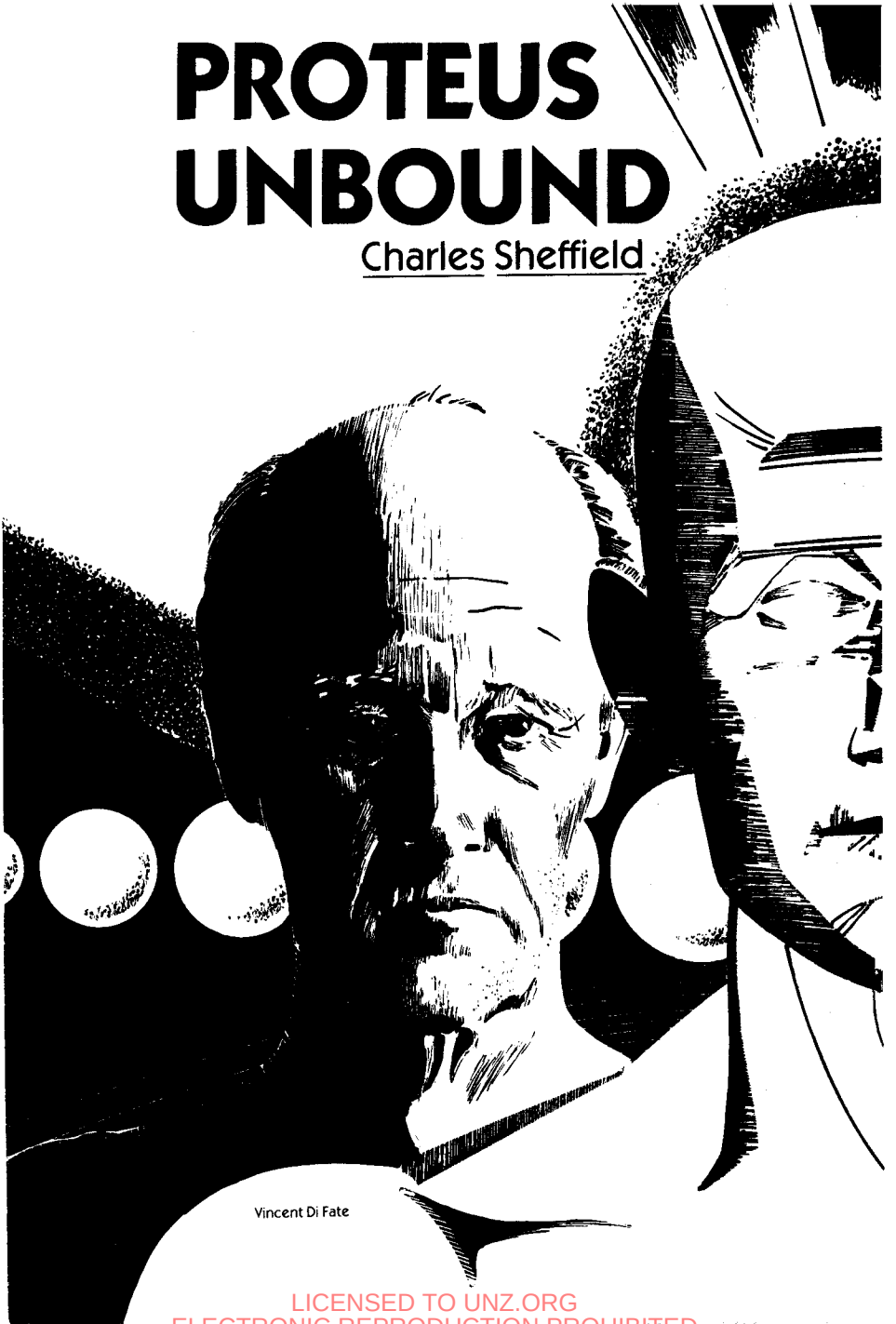

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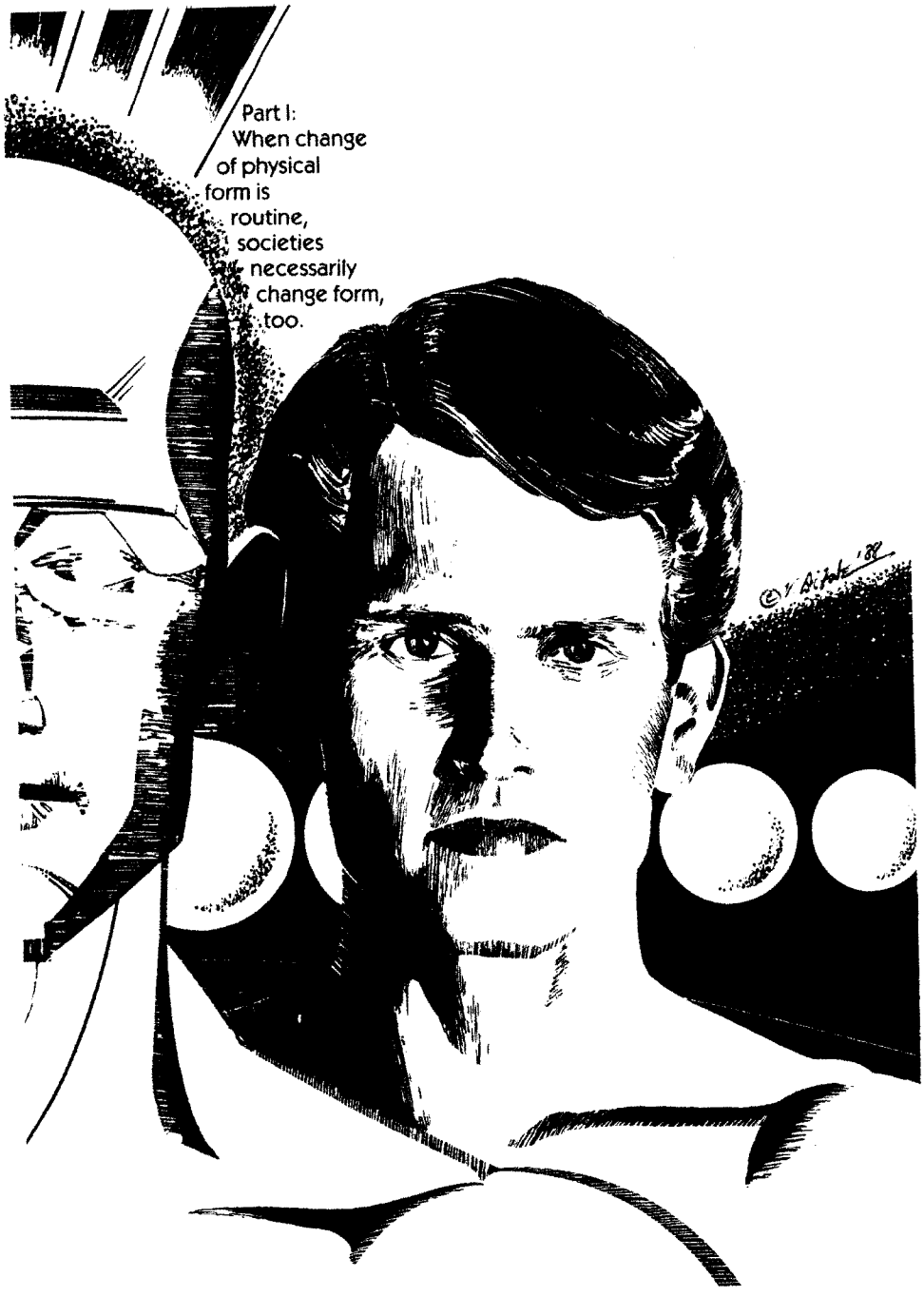

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"S = K. log W"—epitaph of Ludwig Boltzman (1844-1906), carved on his tombstone in Vienna.

CHAPTER ONE

"When change itself can give no more
'Tis easy to be true."

They found Behrooz Wolf on the lowest levels of Old City, in a filthy room whose better days were far in the past.

In the doorway, Leo Manx paused. He looked at the sweating, moldy walls and cobwebbed ceiling, gagged at the rank smell, and retreated a step. The floor of the room was covered with scraps of food and old food wrappers. The man behind pushed on through. He was grinning for the first time since they had met. "There's a breath of Old Earth for you. Still sure you want him?"

"I have to have him, Colonel. Orders from the top." Manx tried not to breathe, and moved forward. He knew Hamming was goading him, as everyone had goaded him since he had arrived on Earth and explained what he wanted. He had to ignore Hamming, the mission was too important to let small issues get in the way.

The furnishings of the room were minimal: a single bed, a food supply line, a sanitary unit, and one padded chair. As Manx moved farther inside the stink became stronger; it was definitely coming from the man slumped in that chair. Bald, sunk-eyed, and filthy, he stared straight ahead at the life-size holograph of a smiling blond woman that covered most of one spotted and water-stained wall. The lower part of the holograph held a verse of poetry, written in letters three inches high.

Ignoring both the man and the 'graph, Colonel Hamming crouched to inspect the little metal box that sat next to the chair. Plaited braids of multi-colored wires ran to the electrodes on the seated man's scalp. Hamming peered at the settings, his nose just a couple of inches away from the control knobs.

"You're in luck. It's so-so, a medium setting."

Manx stared at the seated man's lined, grimy neck. "Meaning what?"

"Meaning he's been emptying his bladder and his bowels when he needs to, and maybe he ate something now and again, so he shouldn't need surgery or emergency care. But he won't have bothered with much else."

"So I see." Leo Manx examined the man with more disgust than curiosity, knowing that in a couple more minutes he might have to touch that greasy, mottled skin. "I thought Dream Machines were illegal?"

"Yeah. So's cheating on taxes. All right, Doc, tell me when you're ready. When I turn this off, he may get nasty. Violent. Losing all his nice dream reinforcement. I've got a shot ready."

"Don't you want to check that we have the right man before we begin? I mean, I've seen pictures of Behrooz Wolf, and this . . . he's . . . well . . ."

The security man was grinning again. "Not quite up to your expectations? Don't forget Wolf is seventy-three years old. You've probably only seen pictures when he's on a conditioning program. We'll check the chromosome ID if you like, but I'll vouch for him without that. It's not the first time, you know. He did this three other times, before he was kicked out of his job as head of the

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Office of Form Control. He always comes here, and he always looks pretty much like this. Never quite so far gone before. When he still had his official position, we came and got him earlier. Can't let a government bureaucrat die on the job."

"You mean this time, if I hadn't asked to find him? . . ."

"You, or someone else." Hamming shrugged. "I don't know how you Cloudlanders do it"—contempt in the voice—"but here on Earth a free citizen can die any damn way he chooses. Get ready, now, I'm pulling the plug. We'll go cold turkey."

Manx hovered impotently near as the security officer flipped four switches in quick succession, then ripped taped electrodes from the bald scalp. There was no sound from the bio-feedback unit, but the man in the chair shivered, gasped, and suddenly sat upright. He stared wildly around him.

"Wolf. Behrooz Wolf," said Manx urgently. "I must talk—"

"Grab his other arm," rapped Hamming. "He's going to pop."

The man was already on his feet, glaring about him with bloodshot eyes. Before Leo Manx could act, Behrooz Wolf had spun around to pull free and was feebly reaching for him with scrawny, taloned hands. The security officer was ready. He fired the injection instantly into Wolf's neck, and watched calmly as the scarecrow figure froze in its tracks. Hamming waved a hand in front of Wolf's face and nodded as the eyes moved to follow it.

"Good enough. He's still conscious. But he has no volition, he'll do what we tell him." Hamming was already turning to pack away the cables in the compact bio-feedback kit. "Let's get him aloft, and dump him into his own form-control unit before he starts to get lively again."

Manx could not take his eyes away from the frozen tormented face. Behrooz Wolf was still glaring at the hologram, not interested in anything else. "Do you think that the form-control unit will work? He has to *want* it to. He seems to want to die."

"We'll have to wait and see. Hell, you can't *make* somebody want to live. You'll know in a few hours. Carry the feedback unit, would you?" Hamming took Wolf's arm and began to walk him toward the door. "Oops. Mustn't forget her. It's the first thing he'll want if he makes it through the form-control operation." He detoured to the wall and pointed to the verse. "That's the way Wolf was feeling. And here"—he poked the projection of the woman in her bare navel—"is the reason for it."

Manx read the verse below the picture.

"My thoughts hold mortal strife; I do detest my life,
And with lamenting cries, peace to my soul to bring,
Oft call that prince which here doth monarchize,
But he, grim-grinning king,
Who caitiffs scorns, and doth the blest surprise,
Late having decked with beauty's rose his tomb,
Disdains to crop a weed, and will not come.

"Gloomy thoughts. What does it mean?"

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"Damned if I know. Wolf was always a nut for old-fashioned things—poetry, plays, history, useless crap like that. He must have thought the poem applied to him."

"That's terrible. He must have loved her very much, to break down like this when he lost her."

"Yeah." Hamming had switched off the projection unit and put the cube into his pocket. He shrugged. "It's odd. I knew her, and she wasn't much of a looker. Good in bed, I guess."

"How long ago did she die?"

"Die? You mean Mary there?" Hamming had taken hold of Wolf's arm again, and was leading him firmly out of the room. He gave a coarse, loud laugh. "Who mentioned *dying?* Mary Walton is alive and well. Didn't you know? She dumped him! Buggered off to Cloudland with one of your lot, some guy she met on a Lunar Cruise. Me, I'd have said good riddance to her, but he took it different. Come on, let's get Wolf up to his tank. I've had enough stink for today."

CHAPTER TWO

"A message is not a message until the rules for interpreting it are in the hands of the receiver."

—Apollo Belvedere Smith

They would not go away. There was nothing to see, nothing to hear, nothing to taste, to touch, to feel. Nothing. And yet there were the voices, whispering, prompting, nudging, cajoling, commanding.

That way. A generalized murmur. *That's where you are going.*

"No. I don't want to change." He struggled, unable to move or speak as he tried to identify the source of the sounds. The argument had been going on inside him forever, and now he was losing. The voices were invading him, micrometer by micrometer.

This way. This way. Change. They were ignoring his wish to rest, pulling him, pushing him, twisting him, turning him inside out. He could feel them now in every cell, stronger and more confident. *Change.* A trillion voices merged. The rush of blood through clogged arteries, organic detergents washing the dry, inelastic skin, the weak, flabby muscles, the old, tired sinews. *Change.* Liver and spleen and kidneys and testicles, ion balances on a roller-coaster, local temperatures anomalously high or low. *(Too high, too low. He was dying.) Change.* The delicate balance of endocrine glands, testes and thyroid and adrenals and pancreas and pituitary. All disturbed, homeostasis lost, desperately seeking a new equilibrium. *Change. Change. CHANGE.*

He cried out, a silent scream. "LEAVE ME ALONE." The intruders ran wild in every cell. He was helpless, fainting, fading before the assault of a chemical army.

CHANGE. All over his body, fluctuations in thermodynamic potentials, in kinetic reaction rates, hormonal levels, energy rushing to dormant follicles, sloughing old tissues, redefining organic functions, thrusting along capillaries. A ferment of cellular renewal, boiling within the changing skin. *CHANGE.* Solvents along sluggish veins and arteries, the sluice of plaquey deposits, the whirl of fats and cholesterol. *CHANGE.* Liver, spleen, kidneys, prostate, heart, lungs, brain . . . *CHANGE.*

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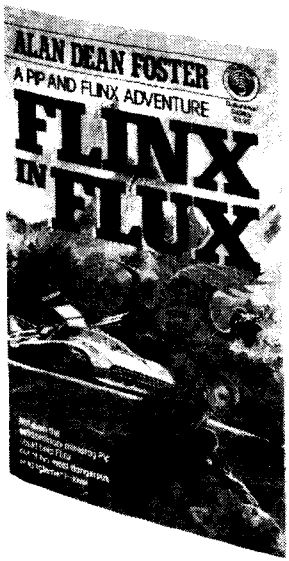

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Fires along nerves, synapses sparking erratically, spasms of motor control, floods of neurotransmitters, flickering lightnings of pain, crashing thunderstorms of sensation, signals flying from reticular network to cerebral cortex to hypothalamus to dorsal ganglia. A clash of arms at the blood-brain barrier. . . . *CHANGE. SYNTHESIZE. ACCOMMODATE.*

. . . and then, suddenly, all voices merging to one voice. And fading, weakening, withdrawing, drifting down in volume. He could hear it clearly. He listened to the murmur of that dying voice, and at last recognized it. Knew it. Knew it exactly. It was the mechanical echo of his own soul, whispering final commands through the computer link. His physical profile, amplified a billion fold, transformed in the bio-feedback equipment to a set of chemical and physiological instructions, and fed back as final commands.

The tide was ebbing. The changes shivered to a halt. In that moment, senses returned. He heard the surge of external pumps and felt the wash of amniotic fluids as they drained from his naked body. The tank tilted and the front cracked open, exposing his skin to cold air. There was a sting of withdrawn catheters at groin and nape of neck, and a slackening of retaining straps.

He felt a growing pain in his chest, a terrible need for air. As the pertussive reflex took over he coughed violently, expelling gelatinous fluid from his lungs and taking in a first ecstatic, agonizing breath. Its cold burn inside him was simultaneous with the sudden full opening of the tank. Harsh white light hit his unready retinas.

He shivered, threw up his forearm to protect his eyes, and sagged back in the padded seat. For five minutes he moved only to lean forward and cough up residual sputum. Finally he summoned his strength, stood up, and stepped out of the tank. He staggered forward two steps, caught his balance, and stood swaying. As soon as he was sure of his own stability he reached for the towel that hung ready by the tank, wrapped it around his waist, and turned back to the form-change tank itself. Another moment to gather his will, then he gripped the door and swung it firmly closed.

It was a final, ritual step; his first choice, after the unspoken decision to live. He was rejecting the idea of tranquilizing drugs to ease the rigors of transition. Instead he walked across the room to a full-length mirror and stared hard at his own reflection.

The glass showed a near-naked man about thirty years old, dark-haired and dark-eyed, of medium height and build. The new skin on his body still bore a babyish sheen, though pale and wrinkled from long immersion. Soon it would smooth and mature to deep ivory. The face that peered back at him was thin-nosed and thin-mouthed, with a cynical downward turn to the red lips, and thoughtful, cautious eyes.

He examined himself critically, working his jaw, lifting an eyelid with a forefinger to inspect the clear, healthy white around the brown iris, peering inside his mouth at his teeth and tongue, and finally rubbing his fingers along his renewed hairline. He flexed his shoulders, inflated his chest to the full,

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moved his neck in an experimental roll back and forth, and sighed.

"And here we are again. But why bother?" He spoke very softly to his reflection. " 'What a piece of work is a man. How noble in reason, how infinite in faculty. In form, in moving, how express and admirable. In action, how like an angel, in apprehension how like a god. The beauty of the world, the paragon of animals.' "

"Very good, Mr. Wolf," said a silky and precise voice from the communications device in the corner of the room. "The Bard wrote it, and perhaps he believed it. But do you?"

Bey Wolf turned, slowly and cautiously. The unit was showing no visual signal. He stepped across and turned on its video and recorder. "You did not let me finish that quotation. It goes on, *'Man delights me not, no, nor woman neither.'* And let me point out that this is my private apartment. Who are you, and how the devil did you get my personal comcode?"

"I brought you there." The voice was unembarrassed. "I helped to carry you up out of Old City—for that, you may thank me or curse me. I set you up in that form-change tank. And I stayed, long enough to turn on your communications unit and note its access code." The screen flickered, and a man's image appeared. "I do not want to intrude on your privacy, and you will note that I was not receiving visual signals until you just activated that channel. I am sure you are still feeling fragile, but I must talk with you as soon as you are recovered. My name is Leo Manx. I am a member of the Outer System Federation."

"I can tell that much by looking at you. What do you want?"

"That cannot be discussed over public channels. If I could return to your apartment, or if you would agree to visit me at the Embassy . . . my time is yours. I came all the way from the Outer Cloud, specifically to seek you. Perhaps you could join me for dinner—if you feel able to eat, so soon after so full a treatment."

Behrooz Wolf stared at the other man. Leo Manx had the piebald look of the fourth-generation Cloudlander, brown freckles on a chalk-white hairless skin. His build was thin and angular, with over-long arms and bowed, skinny legs. "I can eat," he said at last. "Provided it's Earth food—none of your rotten Cloud synthetics."

"Very well." Manx replied without hesitation, but there was a sudden half-humorous twist of the mouth and the flicker of an eyelid. Like any Cloudlander, Manx was disgusted by the thought of food made from anything beyond single-celled organisms. Bey Wolf had insisted on an Earth meal more to gauge Manx's seriousness of purpose than anything else. But now, on the basis of the flimsiest of evidence, he decided that he rather liked Leo Manx. (Nobody could be all bad who recognized Shakespeare.)

"Why not?" he said. "I'll come and see you. I've nothing better to do, and I haven't been outside for a long time."

"Then I await your convenience." Manx nodded and disappeared from the screen.

Wolf consulted his internal clock. Until that moment he had no idea what time it was—nor what day or month it

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was. Mid-afternoon. If he left in the next half-hour he could be at the Embassy before the evening shower. He skimmed his accumulated mail and messages. Nothing worth worrying about. Better face it, since he was fired by Form Control he had become a nonentity. He dressed quickly and dropped ten floors to street level. There he worked his way over to the fastest slideway, threading his way easily through the crowds and staring around him as he went.

A BEC catalog must have been issued since he had fled underground in Old City. The new forms were already appearing on the streets, squarer shoulders, more prominent genitals, and deeper-set eyes for the men, a fuller-bosomed, long-waisted look in the women. As usual, BEC had chosen the styles with great care. They were different enough to be noticeable, but close enough to last year's fashions for the form-change programs to be (just) within the average person's price range.

As Head of the Office of Form Control (*former* Head, he reminded himself) Bey Wolf considered himself above the whims of fashion. He wore his natural form, with minor remedial changes. That made him a rarity. More and more, the people on the slideways all looked the same as each other. It was—soothing? No. Boring. After a few minutes he keyed in his implant to receive the communication channels.

He had a lot of news to catch up on. With his retreat to Old City and his subsequent spell in the form-change tank, he had missed a minor political battle over optimal population levels, the BEC release of a spectacular new avian form, a revised species preservation act that applied to all of Earth, impeachment of the head of the United Space Federation on charges of corruption, and a heated new exchange of insults between the governments of the Inner System and the Outer System concerning energy rights in the Kernel Ring.

He had also, though this was not news, missed seventy-five days of a perfect summer. But why count time, when he no longer had a job? The purposive feedback process could do no more than respond to his will, so there was no doubt that he *wanted* to live, deep inside. But for what?

How weary, stale, flat, and unprofitable. . . . And at that very moment, before the familiar words could complete themselves in his mind, the madness began again. The slideways and the scene from the news broadcasts darkened as another image was overlaid on them.

The Dancing Man. He was back. Dressed in a scarlet, skin-tight suit, he came capering across Bey's field of vision. He danced backwards, with jerky, doll-like movements of his arms and legs. There was curious music in the background, atonal yet tonal, and the man was singing, in a tuneful, alien manner that sounded like Chinese. In the middle of the screen he paused and grinned out directly at Bey. His teeth were black, and filed to points, and his face was as red as his suit. He spoke again, seeming to ask a question, then waved, turned, and danced backwards out of the field of view.

Bey shivered and put his hand to his head. He had heard Manning's words underneath Old City, but the Colonel

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had been wrong. The loss of Mary had been desperately painful; he thought of her every day, and he would carry her holograph with him always. But something else had driven him over the edge, to seek the solace of the Dream Machine: conviction of his own growing insanity.

Since the dancing man had first appeared, he had checked every possible source of the signal. No one else could see it—even when they were viewing the same channel as Bey. Every test for outside signal had proved negative. He had mimicked the Dancing Man's speech, all that he could remember of it, and been told by specialists in linguistics and semiotics that it corresponded to no known language. Worst of all, when Wolf went into recording mode the signal vanished. It was never there to be played back. Physicians and psychiatrists were unanimous: the signal was generated within Bey's own head. He was suffering "perceptual disturbance" of a "severe and progressive form, intractable and with a strong negative prognosis."

In other words, he was going crazy. And no one could do a damned thing about it. And it was getting worse. At first no more than a scarlet spot on the scene's horizon, the Dancing Man was getting steadily closer.

And the ultimate irony: as long as he and Mary had lived together, he had been concerned with *her* sanity, *her* mental stability! He was the impervious rock, against which the tides of insanity would break in vain.

Wolf saw that he had reached his destination, the deep-delved Embassy of the Outer System. He fled for the express elevators (*". . . then will I headlong run into the Earth; Earth gape. Oh, no, it will not harbor me. . . ."*) and plunged down, down, down, rejecting his own frantic thoughts and seeking the cool caverns of underground sanctuary.

CHAPTER THREE

"I fled him down the nights and down the days,
I fled him down the arches of the years.
I fled him down the labyrinthine ways
Of my own mind. . . ."

The average surface temperature of real estate in the Outer System is minus two hundred and fourteen degrees Celsius: fifty-nine degrees above absolute zero, where oxygen is a liquid and nitrogen a solid. The mean surface gravity of that same real estate is one four-hundredth of a gee. Mean solar radiation is 1.2 microwatts per square meter, weaker than starlight, a billionth as intense as the Sun's energy received by the Earth.

Faced with those facts, the designers of the Earth Embassy for the Outer System had a choice: should they locate the Embassy off-Earth, and face extensive transportation costs to and from the surface for all Embassy interactions? Or should they accept an Earth environment uncomfortable and highly unnatural to the Ambassador and staff? Since the designers were unlikely to visit Earth themselves, they naturally took the cheaper option. The Embassy that Bey Wolf was visiting sat five hundred feet underground, where temperature, noise, and radiation could all be controlled.

Gravity was another matter. He

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dropped with stomach-wrenching suddenness through the upper levels. As he did so his surroundings became darker, quieter, and colder. Every surface was soundproofed. At four hundred feet the hush became so unnatural and disturbing that Bey found himself listening hard to nothing. He decided he did not like it. Humans make noise, humans clatter and bang and yell. Total silence was inhuman.

Leo Manx was waiting for him in a room so cold that Bey could see his own breath in the air. The Cloudlander remained upright long enough to shake Bey's hand and gesture him to a seat, then sank with a sigh of relief into the depths of a water-chair that folded itself around his thin body. The head that was left sticking out smiled apologetically. "I used a form-change program to adapt me to Earth gravity before I left the Outer System." His shrug emerged as a ripple of the chair's black outer plastic. "I don't think it was quite right."

A piece of your lousy software, by the sound of it. Bey merely nodded and waited.

Manx sat silent for a few moments, and then said abruptly: "My visit to Earth, you know, is for a very specific reason. To see you and to ask for your help—as the head of the Office of Form Control and Earth's leading expert on form-change theory and practice."

"You're a bit late. I'm not with that office any more."

"I know that is the case. I heard you had . . . resigned your position."

"No need to be diplomatic. I was fired."

The pale head bobbed. "In truth, I knew that also. You may be surprised to learn that from our point of view, your dismissal offers advantages."

"None from my point of view."

"It is my task to convince you otherwise." Leo Manx stretched upwards, his thin neck and hairless head craning like a turtle from the black supporting oval of the chair. "To do so, I must request your silence about what I am to tell you."

"Suppose I refuse to go along with that?" Wolf saw the other man's discomfort. "Oh, hell, get on with it. I've spent my whole career not talking about things. I can do it for a while longer."

"Thank you. You will not regret it." Manx subsided in the chair. "Mr. Wolf, there has arisen in the Outer System a problem so serious that all knowledge of it is given only on a need-to-know basis. In a few words, there has been a widespread breakdown in the performance of form-change equipment, to the point where the process is being undertaken only in cases of emergency, such as my own visit to Earth."

"Widespread? Not just a machine or two?"

"Hundreds of machines, with rates of malfunction that have been growing rapidly. A year ago, we could point to two or three cases of gross error in results. Today, we have case histories of thousands."

"Then it has to be a general software problem. You don't want me for that. There are others who know more and can give you better guidance."

Manx's eyes, startlingly round and hollow in the absence of eyebrows, looked away. "If you are perhaps thinking of Robert Capman . . ."

"I would, but he's on a long-term

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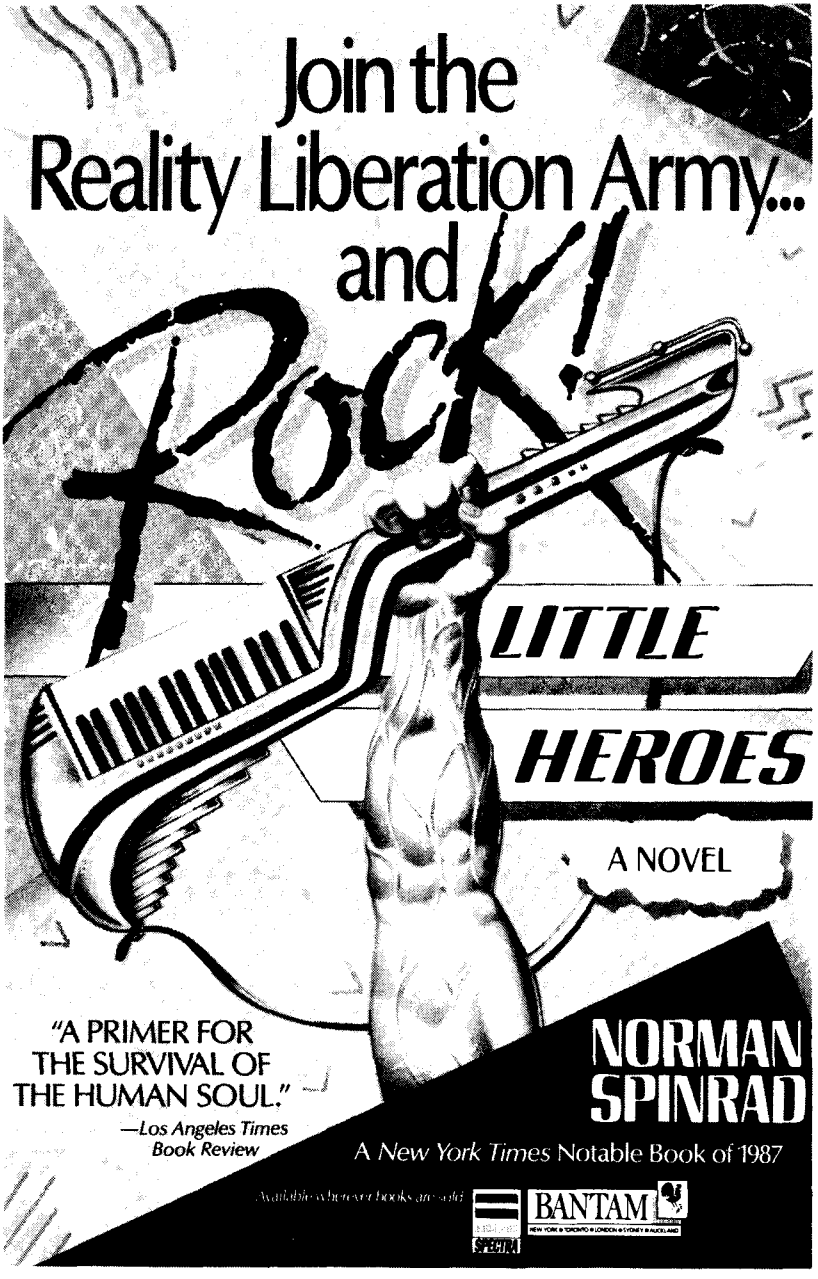

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stellar mission. My suggestion is BEC themselves. Why not call them in? —they'll be as keen to sort this out as you are." Bey tried for an innocent expression. Here was as good a way as any of testing the honesty of the Cloudlander.

Manx looked pained. "We already approached the Biological Equipment Corporation. They sent a team of experts, who reviewed everything we could show them and declared that they could find no evidence of any problem. Unfortunately, we are not convinced that they conducted as thorough a review as one might wish. There has been a long-term disagreement with BEC, as to the proper amount of royalties the Outer System is accruing for the use of BEC's form-change hardware and software systems—"

"They say you stole their ideas, ignored their patents, and infringed their copyrights."

"Well, that is a little crudely put . . . but, yes, you have the gist of their argument." Manx smiled ruefully. "I see that our own security is less than we are inclined to believe."

"In a case like that it is—BEC will tell anyone on Earth who'll listen that the Outer System is robbing them blind."

"Which is certainly a—a—"

"Lie?"

"Exaggeration. A misrepresentation."

"You don't need to persuade me. I don't like monopolies, either, and BEC has one for the Inner System. But you said they did a review of 'everything we could show them.' Like to be more explicit?"

There was a raising of non-existent eyebrows. "You are a very perceptive man. There were a number of units that we could not and did not show to the BEC team."

"Pirated designs?"

"The Outer System prefers to think of them as independent developments. However, I believe it would have made little difference. The anomalous behavior occurs with rather greater frequency in BEC's own equipment. Yet they insist that everything is working perfectly."

"Did your own engineers watch the BEC tests?"

"Yes. As BEC said, no anomalies were observed. As soon as they left, new peculiar forms were again produced." Manx began to push away the enfolding arms of the chair. "If you would be interested to see some of those forms, I have images here with me. . . ."

"No. You'd be wasting your time."

"These forms are extremely strange."

"Dr. Manx, odd forms don't do anything for me. I've seen so many of those over the years, I doubt if you could surprise me." Bey stood up. "I accept that you have a nasty problem, but it's not one that would justify dragging me partway to Alpha Centauri. I lost my job, but I still like Earth. And I doubt if I could do anything to help you."

"How do you know that, without personal observation?"

"I've been around form control for a long time. As I said at the beginning, you have a software problem. The fact that BEC's team couldn't find it—or chose not to—makes no difference. Call 'em again, ask for Maria Sun. If anyone can solve it for you, she can."

Manx stood up too. "Mr. Wolf, it is

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my opinion that you underestimate both yourself and the difficulty of this problem. But I cannot change your mind about that, here on Earth. Rather allow me to introduce a new variable into the equation. While you were on the way here I asked for and read a copy of your dossier from the Office of Form Control. It is something that I ought to have done earlier. I learned more of your personal circumstances."

"You found out I'm going crazy."

"You are sick. If you know anything of the Outer System, you may know that we are advanced in the treatment of mental illness. That happens to be my own field. If you would agree to travel back with me—merely to observe the phenomena for yourself, for no more than a few days—I will devote my best efforts to your personal problem."

"Sorry. It's still negative." Bey headed for the door, but Leo Manx made a great effort and was there first.

"One more point, Mr. Wolf. And please excuse this importuning. You lived with Mary Walton for seven years. Is it possible that your reluctance to visit the Outer System arises from a fear that you may be obliged to interact with her there?"

Bey eased past the other man, trying not to touch him. "You're a conscientious and persistent man, Dr. Manx. I don't resent that—I respect you for it. I can't answer your question. Maybe I'm afraid I would meet Mary again. But in any case, I still refuse. Tell your superiors that I am honored to be considered."

"Yes, of course. But if by chance you should change your mind—" Manx was calling after Bey as he headed for the elevator. "I will be here on Earth for two more days! Call me, at any hour."

But Wolf was already out of earshot. The final question about Mary had got to him more than it should. Was he over her, or wasn't he? Would he turn down a potentially fascinating problem simply because he might be forced to see Mary with the man she had chosen over him?

He was oblivious of the high-acceleration ride to the surface, oblivious of the evening crowds that pushed at him on the slideways. Manx's offer of dinner had never been realized, but in any case Bey had lost his appetite. He skipped dangerously across from high-speed to low-speed track, exited the slideway, and hurried into his apartment. He grabbed a projection cube at random from the file—they were all of Mary, it made little difference—and sat down to view it.

Predictably, it was one he hated to watch, but also one he had viewed again and again. Mary in an amateur musical, dressed in a long gown, bonnet, and parasol, and singing in the sweet, artificial little voice of a young girl. "Let him go, let him tarry, let him sink or let him swim. He doesn't care for me, and I don't care for him. He can go and find another, that I hope he will enjoy, for I'm going to marry a far nicer boy."

Bey felt his heart wither inside him as he watched. Nothing of her had faded; it hurt as much as ever. He was reaching to cut the cube when Mary Walton's demure figure rippled and darkened. A new scene was overlaid on the old and familiar one.

The Dancing Man. Twisting and tumbling across the image, red-clad limbs

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akimbo. He paused in the middle, nodded at Bey, and made a sing-song, questioning little speech that could almost be understood. Then he was away, skating backwards into the distance, head bobbing and hands waving cheerfully.

The Dancing Man—even here! In the middle of a sequence that Bey had recorded personally, four years ago. How could anyone possibly change that recording? Bey set the projection again to the beginning, and forced himself to watch it through again. This time there was no Dancing Man. It was Mary all the way, to that intolerable final line when she set her parasol over her shoulder and waved goodbye.

Bey watched to the bitter end. Then he went across to the communications unit and called Leo Manx.

CHAPTER FOUR

"All isolated systems become less orderly when left to themselves."
(This version of the Second Law of Thermodynamics was offered by Apollo Belvedere Smith, aged five, to explain why his room was in such a mess.)

"There is one other thing you ought to decide before we embark." Leo Manx was inspecting both his traveling companion and Bey Wolf's luggage.

"Namely?"

"Do you want to spend time in a form-change tank on the way out to the Cloud? If so, we must make sure that the programs are available."

"You mean, switch to something more like your own form, for physical comfort?" Wolf shook his head. "I like this form, and I know it tolerates low gravity and cold pretty well."

"That was not the reason for my suggestion." Manx took Bey Wolf's little traveling case and floated it one-handed across to secure it in the cargo hold. "My concern is with the response you may receive from Outer System citizens. It will be apparent to them that you are from Earth, or at least from the Inner System. The two Federations are not at war—"

"Yet."

"—but we are certainly locked in an economic struggle over rights to the Kernel Ring. There have been skirmishes in the Halo. If you remain in your present form, I foresee some unpleasantness and rudeness when we arrive. You will hear yourself called a Snugger—a Sunhugger Imperialist; there will undoubtedly be sly remarks about your hairy skin."

"Same as you've been getting, when people here call you a bare-faced Cloudlander?" The other man's reaction was no more than a moment's twitch of the lip, but Bey was used to reading subtle signals. "Dr. Manx, if you got by on Earth without form-change, I can do the same in the Outer System. I'm used to criticism and sneaky comments."

"Actually, I went through a small form-change on the way here; a very minor adaptation—otherwise Earth gravity would have been too much for me. But it was quite different in my case. I knew I would be here only for a little while, until you accepted or rejected our plea." Manx caught Wolf's expression, and realized he had made a mistake. "Of course, you have agreed to stay only long enough with us for a preliminary evaluation of the problem. I realize that. But I was hoping, if you

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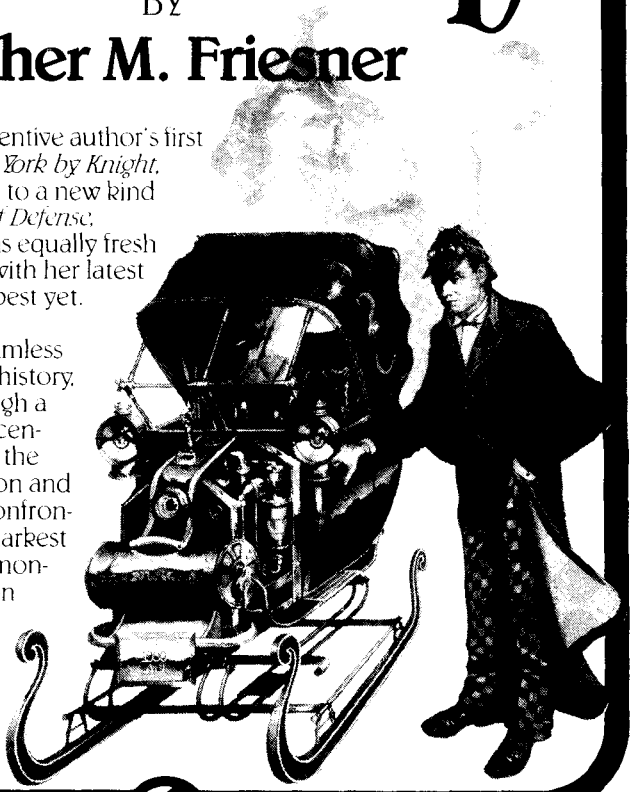

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find the situation intriguing enough, that you might prolong your stay. Not only for our sakes, for yours. If one has never visited the Outer System, there are many things to see and do."

"No sales pitch. If you're wrong, it's not worth it. If you're right, I can use a program when we get there."

"That is true."

"So what are we waiting for?"

Manx gestured out of the port. Bey suddenly realized that they were not waiting. Earth had disappeared, and they were already passing the Moon. The McAndrew inertialess drive had been switched on while they were talking, and they were accelerating away from the Sun at more than a hundred gees.

"Twelve days to cross-over point, then another twelve to the Opik Harvester," said Manx. "It is not the nearest Harvester to Sol, but it has a large number of form-change units on it. I have discussed our destination with my superiors, and we agree that it is a good place to begin."

"How far out?"

"Twenty-six thousand a.u.—about four trillion kilometers."

Manx called a stylized three-dimensional figure onto the display screen. It was a representation of Sol-space geometry. Even with a logarithmic radial scale, the graphic occupied one full wall of the cabin. The Inner System, comprising everything out to Persephone, was crowded within a Sun-centered sphere of ten billion kilometer radius. The Halo reached out two hundred times as far, a diffuse torus within which the Kernel Ring sat as a well-defined narrow annulus. The Oort Cloud, home for the Outer System, was a vast sprawling spherical region, approaching the Halo on its inner limit, but seven times as large as its outer edge, stretching a third of the way to the nearest star.

Manx pointed to a cluster of color-coded habitats in the Outer System, and to the arrowed flight path that extended to them from the Earth-Moon environment. "The Opik Harvester is fairly near the inner edge of the Cloud, but a safe distance from the Kernel Ring. No danger of trouble from there. As you can see from our trajectory, we'll be flying rather close to the Ring itself in about nine days." He gave Bey a sideways glance. "I thought you might be personally interested in taking a look at that."

Bey was learning. Leo Manx's omissions—rarely accidental—were more informative than his speeches. Manx was too self-conscious or diplomatic to say some things himself. He preferred to leave logical loopholes, then answer questions.

"I have never been near the Kernel Ring," said Bey. "I assume you know that."

"Your background summary says as much."

"Then it should also show that I know little about Kerr-Newman black holes, and even less about how we use the kernels themselves as energy sources."

"That is indeed the case." Polite, and noncommittal. Bey would have to dig deeper.

"So what makes you think I have any personal interest at all in looking at the Kernel Ring? Do you think you see a connection with my . . . other prob-

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lems?'' Damn it, the habit was catching. He was getting as indirect as Manx. ''I mean, with my hallucinations.''

Instead of answering at once, Manx sat for a few moments, thinking. ''That depends on the cause of those hallucinations,'' he said at last. ''I hope that we will explore that subject together on this journey, when we have plenty of time. But answer me one question, if you will. When did your problems begin? Was it before or after Mary Walton left you.''

''Long after. Four months after.''

''In that case, I do not believe that the Kernel Ring is connected with your hallucinations.''

It was like pulling teeth. ''But the Ring *is* connected with Mary?''

''Possibly. Probably.'' Manx was getting there, Bey could see the decision reflected in the expressions on the other man's face. ''Mr. Wolf, I deduce that in addition to knowing little about the Kernel Ring, you also are unfamiliar with customs in the Outer System. According to Colonel Hamming—whom I did not find to be a particularly sensitive person—''

''He's an asshole.''

''A felicitous description. He told me Mary Walton left to 'run off to Cloudland with one of you guys,' and the inference was that he was referring to a person from the Outer System, one that she met on a Lunar Cruise. Is that your own understanding of the situation?''

''It is.''

''Did you ever meet this person?''

''Not a person. A man. No, I didn't meet him. If I had I'd probably have tried to cut him in two.''

''So you are unfamiliar with his appearance? Now, if you will permit me a more personal question. You knew Mary Walton better than anyone else. Was she a woman impressed by appearances?—how a person looked, whether he was handsome.''

''I guess so.'' More stalling! Bey cursed his own reluctance to give straight answers. ''Yes, she was. Too impressed. Looks mattered to Mary.''

''Very well. You know what men from the Outer System look like. I suspect that I am a fairly typical example, and although I am quite happy with my own appearance''—Manx looked admiringly at his skinny body and bowed legs—''I know that I am far from the standards of beauty currently popular on Earth.''

''That's irrelevant. Handsomeness is easy, all it takes is a little while in a form-change tank.''

''Very true. *If* a person wishes to make such a change. I certainly did not, and you had a similar reaction when it came to modifying your own appearance to match an Outer System form. However, there is a more important point here. Although the man that Mary Walton ran off with *could* have picked an appearance that appealed to her, he would have had to do so *in advance* of meeting with her on that Lunar Cruise.''

''I see where you're heading. You are questioning that he was from the Outer System?''

''More than that. Mr. Wolf, our citizens do not indulge in Lunar Cruises. To us, it would have as much attraction as a tour of Old City would offer the average Earth person.''

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"But some people might do it. Just to be different."

"They might." Manx looked away, refusing to meet Bey's eyes again. "But they did not. I have rather more information than I have so far revealed to you. Before I left our Earth Embassy, I checked all our visitors to Earth-Moon space for the previous four years. There was no one from the Outer System who went on a Lunar Cruise. Whoever Mary Walton met, he was not from our Federation."

"So where does that leave us?"

"With no more than a speculation. I have of course no direct evidence—"

"Talk, man! I can stand it."

"I do not think you will find your Mary in the Cloud, even if you plan to look for her there. The most likely person to have offered a false identification, and to be interested in Earth-Moon space as a possible source of energy needs, would be a renegade."

"You mean a rebel? An inhabitant of the Kernel Ring."

"Precisely."

"Someone who works in the high-gravity environment around shielded kernels. Someone whose unmodified appearance is more like mine than yours."

"You follow my thoughts admirably." Manx moved the cursor on the display to delineate the annulus of the Kernel Ring. "Here. To conclude, it is my opinion that Mary Walton is not to be found anywhere in the Outer System. She is *here*. In the Halo, almost certainly somewhere in the Kernel Ring itself."

"Shacked up with a damned outlaw."

"I'm afraid so. A dangerous man, Mr. Wolf, who recognizes the sovereignty of neither my Federation nor your own. A man who would not hesitate to kill either of us. Mr. Wolf! Do you hear me?"

Bey was no longer listening. As Manx had moved the cursor across the display, a familiar figure had appeared on top of it. He was sitting cross-legged, riding the little blue arrow and waving jauntily out at the two men. His song sounded a little different, but still just beyond comprehension.

The scarlet suit was brighter than ever. The expression on his grinning face was more than usually smug. Forget that hope, it said. It takes a lot more than a move to the Outer System to get rid of the Dancing Man.

CHAPTER FIVE

Kernel *(def.): A Kerr-Newman black hole, i.e. a black hole that is both rotating and electrically charged. Kernels are found in nature only in the* Kernel Ring *(q.v.) between the Inner and Outer Systems. They range in mass from a hundred million to ten billion tons.*

—Webster's New Worlds Dictionary.

At the end of the seventh day Manx began to push for a different approach. He had switched off his recorder and was glaring impatiently at Bey Wolf.

"I suppose you imagine that you are cooperating with me? You are not. I ask you for a full, detailed account of your relationship with Mary Walton, something I must have if I am to help you end your hallucinations. What do I get?" He tapped the recorder. "Monosyllables. Two or three sentence de-

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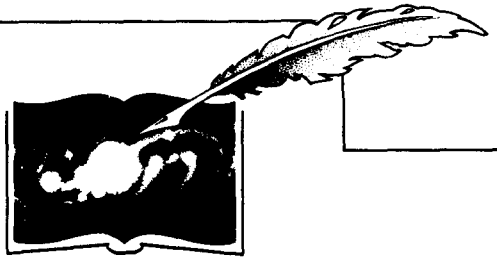

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scriptions of complex interactions. Evasion. Obfuscation. Equivocation. Deliberately or not, you are prevaricating."

"I'm sorry. I don't like to talk about emotional matters. Particularly *those* emotional matters."

"Of course you don't. No one does, unless they have quite different mental problems. But if there's to be any progress you have to give me information. *Detail.* As much of it as you can. I perceive that you will not do so with simple question-and-answer techniques."

"So we're stuck?" Bey sounded more relieved than upset.

"No, we are not. With your permission, I want to put you into an enhanced recall status."

"That's illegal."

"Not in the Outer System. We have nó statutes against self-incrimination."

"Barbaric."

"Perhaps we have less need of them. Stop trying to change the subject by inciting an argument. Will you allow me to induce an enhanced recall state, or will you not?"

Wolf looked at him warily. "For how long?"

"If I could tell you that, I might find it unnecessary. A couple of days, maybe more."

"Then I'll miss the transit of the Kernel Ring you want me to see." It was a weak argument, and Bey knew it. Leo Manx was slow but persistent, like the turtle he sometimes resembled, and he would not give up easily.

"That crossing will occur tomorrow. Is it agreed, then? After we complete the transit we will move to enhanced recall technique. If the idea still makes you uncomfortable we can begin with direct reporting, then proceed to stimulated and dream sequences."

Bey nodded. At best it felt like a stay of execution.

The transit of the Kernel Ring was an anticlimax. Even with the highest magnification that the ship's sensors could provide, the Halo was no more than a scattering of misty dots of light. The unshielded kernels themselves gave off large amounts of energy, gigawatts for even the most massive and least active, but they radiated at wavelengths too short for the human eye to see. The shielded kernels were by design invisible. It was difficult to imagine people living in that emptiness; still less that it was the home of bloodthirsty pirates, savages who might come boiling up from the darkness to take over cargo or passenger ships as they made their out-of-ecliptic transit from the Inner Systems to Cloudland. Least of all could Bey imagine Mary, his lively, cosmopolitan Mary, enduring that waste of nothingness.

"You see with an Earthman's distorting perspective," said Manx, in answer to Bey's sceptical reaction. "To you, the Halo is nearly empty. To me, or to anyone from the Outer System, it is packed with life and energy."

"You use an odd definition of 'packed.' "

"Do the calculation for yourself. There are millions or billions of people living in the Halo—we have no idea how many, since there is no central government there. Compare it with the Outer System. We are about fifty million people, and we know that we are

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grossly under-populated. We will be for centuries. Naturally, we crowd together, most of us close to the Harvesters, but were it not for the help of our self-reproducing machines we could not exist. If we spread out evenly, each person in the Outer System would have a region sixty times as big as the whole of your Inner System to move around in. By comparison, the Halo is packed. It teems with life. Much too crowded for us."

Current accommodation allotment on Earth: one hundred cubic meters per person. Bey thought of that, and wondered why the Outer and Inner System were arguing over rights to the Kernel Ring. From what Manx was saying, there was no way that the average Cloudlander would ever be comfortable with the "cramped" life style in the Ring, and no way that the average Earth-dweller would be able to accept so much empty, frightening space.

"The argument is over energy—but surely there are more than enough kernels for everyone?"

"I wonder that myself," said Manx. "And there is an element of presumption that leaves me uncomfortable. Both the Inner System and the Outer System governments assume that they could if they wished displace the present rulers of the Kernel Ring. I am not sure that is the case. Have you heard of a leader called Ransome, and of Ransome's Hole?"

"Black Ransome? According to Earth's newscasts, he's just fiction."

"If they believe that, they have never left Earth. I know of a half dozen prospectors working the Halo who have lost cargo to Black Ransome. Some have lost ships also. It is a reasonable speculation that some have lost their lives, too, and are in no position to report anything. At any rate, true or not, the Outer System seethes with rumors about Ransome. Ships found empty and gutted, cargoes taken, crew and passengers ejected to empty space."

"If he's such a problem, why don't you send a force in to take care of him?"

Manx waved at the displays. "Find him, and maybe we could do it. His base is as much a mystery as he is. Ransome's Hole—or maybe it's really Ransome's *Hold*, everything about him is hearsay—is supposed to be somewhere in the Kernel Ring. But where? You're talking a volume of space thousands of times as big as the whole Inner System. And if we found him, I'm not sure any force that we sent in would win. Ransome's Hole is supposed to have its own defense system, able to handle anything we could throw at it. And he might have allies. The whole Halo is a melting-pot, the place that anyone can flee to if they find civilization intolerable."

"Or we find *them* intolerable." Bey bent to the high-resolution sensors with new interest. Was one of those spots of light, disappearing fast behind the speeding ship, some huge, well-armed base of rebel operations? And what else was down there, hidden in the darkness? Perhaps some lost colony of ancient doctrines, varnished from the rest of the system. *'Home of lost causes, and forsaken beliefs, and unpopular names, and impossible loyalties.'* Who had said that? One of the Victorians.

"Black Ransome." Bey looked up. "Where did he come from, the Inner or the Outer System?"

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"We don't even know that much. He must have plenty of energy, because he never takes the kernels from the ships. But where does he get his food supplies, or his other equipment? We just don't have answers to those questions."

The Kernel Ring was fading behind them. Leo Manx turned off the displays. Bey saw that he was holding the polished black cylinder of an enhancement recall unit, and smiling in what looked like anticipation.

"And we will find nothing about Ransome here, Mr. Wolf. We are past the region where the ship is in danger of attack. So we can now proceed to possibly more productive work. When you are ready. . . ."

. . . I met her at an open-air historical event, seven years and four months ago, when there was an exhibit of old Earth animals. It was the first time they showed results of breeding back successfully beyond the Cretaceous, and the big extinct forms had attracted a lot of interest.

I say I met her, but that is at first an overstatement. I was in an overview booth, with half an eye for illegal forms (not much chance of that; I hadn't seen one for years) when I saw her, though she was too far away for me to speak to her. But my eye picked her out at once.

No, it's not that I was attracted to Mary Walton at that point, not at all. I was *puzzled* by her. I had been in the Office of Form Control for more than half my life, and one thing that I had learned to do, whether I wanted to or not, was to monitor for anomalies. It was an unconscious act with me, and it's more than half the trick to spotting an illegal form.

In Mary's case, I knew there was something peculiar, though it certainly wasn't something illegal.

It was this. As you can see, I choose to hold my own appearance to about age thirty, but that's unusual on Earth. Most people like to look between twenty and twenty-five, with twenty-two the most popular age. Now, sometimes you will get older people who don't like that idea. They want to separate themselves from the real youngsters for some activities, and they spend at least part of their time in a form corresponding to age forty or fifty—even more, though anyone over sixty is very uncommon, unless they have other problems and drop the use of form-change treatments altogether. You saw the results of that when you picked me up in Old City.

Mary Walton was wearing the form of a woman between forty-five and fifty, and dressed in the clothing style of a woman of that age; but I could tell from other indicators —eye movement, laughter, body posture—that she was actually a lot *younger* than she looked. It intrigued me. Why would anyone deliberately choose a form older than their true age?

While I was watching her, we had a minor problem with staffing, and I had to look elsewhere. But as soon as I could, I went to the place where I had last seen her, next to the big enclosure with the gorgosaurus in it. She was still there—trying to climb into the enclosure. If she had succeeded . . . the animal was carnivorous, four meters tall, two tons in weight.

I arrived just in time to drag her clear.

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And to arrest her. And then to introduce myself.

She told me she was an actress, she was doing it for publicity. I suppose I knew, right from the first moment, that she was crazy. Insane, hopelessly unaware of reality.

It made no difference. Others will say that Mary was not conventionally attractive, that she deliberately chose to look exotic and a little peculiar. When she was living a part—she didn't act parts, she lived them—she might form-change to any age, and do anything she felt fitted the character. Some of them were strange, sometimes disgusting.

As I say, to me it made no difference. From the first moment she looked down at me from the fence, when I had hold of her leg and I was pulling her back by her long grey skirt, I was lost. I was spoiling her publicity plan, but she didn't look annoyed. She grinned down at me, with her head on one side and that ridiculous round grey hat with a feather in the side of it, and the blond curly hair pushing out underneath it—she was naturally fair, though she preferred parts that made her a brunette. And then she let herself go limp, and she came rolling off the fence in that old-fashioned grey cloth dress, and knocked me flat to the ground.

I was smitten even before I got up, and I knew it; but I wouldn't have done one thing about it. I have never been able to let people know how I feel. I have rationalized that, to the point where it does not usually bother me. Often, I insist it is a virtue. But not this time. I wanted Mary, but Mary was an unattainable prospect.

It wasn't just my inability to speak. I knew, even if she didn't, that I was three times her age. That alone should have made the whole thing impossible. Not for Mary. I didn't realize it at the time, but things like that made no difference at all to her. She was so much in her own world, and that world was so far from reality, age wasn't even a variable. When she did find out how old I was, she just said, "Well, that means I'll have at most fifty years of you, instead of a hundred."

How do you reply to something like that?

If you are a wise man, you don't even try. You grab the chance—it only comes once—and make the most of it.

That first day, I began to arrest her. She talked me out of it in about two minutes, and took me home to her apartment. I never left.

I had no idea at the time how sick in the head she was. That emerged little by little, as we came closer. Maybe it was a lot more obvious to others than to me. I always had the blinders on—I still do. When an old friend of mine, Park Green, came to visit from the Moon, we went to see one of Mary's performances. I asked him what he thought of it, and he shook his head, and said she was good, but he could see the skull beneath the skin. I hated him for that, and I never told Mary; but he was right.

That may have been the thing that limited her as an actress. She could play high drama, or artificial, mannered comedy, or broad farce—she was a wonderful comedienne, but she didn't much care for those parts. What she could not portray were simple people, because there was nothing simple inside

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her that she could build on. It limited her. She was always busy, always working, but in the end I know that she was disappointed with her reputation.

You know, I honestly believe that I was good for Mary. In our years together she never had to go for official treatment. There'd be times when she went nonlinear, and when that happened I'd drop everything I was doing and stay with her constantly. And she'd come out of it. But those times became more and more frequent, and more and more severe.

When she suddenly told me, without a day's notice, that she was going off for a Lunar Cruise, I was delighted. Mary was always at her best when she had a new environment to learn, something fresh to challenge her. She was becoming more and more upset by crowds—an odd omen for an actress, but I didn't read it. The Moon would offer plenty of peace and change of pace.

She went. She called once, to say that she was not coming back, she was heading for the Outer System. And that was all.

I just about came apart.

Four months later, the Dancing Man appeared for the first time. And I came apart completely.

Bey lay back in his chair and looked up at Leo Manx. "Well?"

"Good." Manx was examining his records. "Very good."

"You have enough?"

"Goodness, no." Manx was incredulous. "This is a *start*—the first iteration. Now we can perhaps begin to learn something about you and your relationship with Mary. Give me another couple of days. Then it may be time to worry about your little dancing friend."

CHAPTER SIX

"Entropy is missing information."

—Ludwig Boltzmann (1844-1906).

"Entropy is information."

—Norbert Wiener (1894-1964)

"Entropy is leftovers."

—Apollo Belvedere Smith (2217-)

One quarter of the way to the edge of the Oort Cloud; it did not sound too far. Call it twenty-six thousand astronomical units, and it became more substantial. Call it four trillion kilometers; it was then an inconceivable number, but no more than a number.

To appreciate the distance from Earth to the Opik Harvester it was necessary to have direct sensory inputs. Bey Wolf looked back the way they had come and searched for the Sun.

There it was. But it was the Sun diminished, Sol with no discernible disc, Sol dwindled to the bright, brittle point of Venus on a frosty Earth night.

'The element of fire is quite put out. The sun is lost, and Earth, and no man's wit, can well direct him where to look for it.' Bey, still staring back the way they had come, took no comfort from the old words and longed for the cosy familiarity of the Inner System. At his side, Leo Manx was looking the other way, scanning the starfield ahead.

"Eh-hey! There we are! Ten more minutes, we'll be home." He had already shed his loose travel suit in favor of a pale yellow one-piece. His hairless arms and legs stuck out from it like the limbs of a gigantic and excited cricket.

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"There, Mr. Wolf. See it now? The Harvester!"

He spoke as of a first sighting, but he had already pointed out the Opik Harvester to Bey an hour before, as a dark spot occulting a tiny patch of stars. But now, as the clumsy bulk drifted closer, glimmering with feeble surface lights, his excitement was increasing.

Bey followed the pointing finger. For eyes conditioned by the constraints of gravity, the shape of the Harvester was difficult to comprehend. A dozen spheres clustered loosely to form a central grouping, but their coupling was done by the invisible bonds of electromagnetic fields, and the configuration constantly changed. Long, curving arms cantilevered away from the central nexus, reaching out to bridge a gulf that had no end. The final silver girders and antennae of those arms grew gradually thinner and less substantial, fading so slowly into void that their terminal points could not be seen.

According to Leo Manx, the big middle sphere was roughly twenty miles across. Bey could not verify that. It was impossible to gain any sense of scale from the Harvester's main features. The whole structure had been built by self-replicating machines of widely differing sizes, and designed to be run by them. Humans had been late arrivals, occupying the Harvesters only when the final step of life-support systems had been added.

The ship's McAndrew drive had been switched off two hours earlier, ending the signal silence introduced by the ionized plasma that propelled it. The communications unit had at once begun to scroll and chatter, urging Wolf and Manx to join a meeting that was already in progress.

Manx, happy to be back in "decent" gravity, watched Wolf's clumsy movements for a few seconds as they disembarked, then grabbed him by the arm. "Hold tight. You can practice later." He towed a weightless Bey along a succession of identical corridors, all unoccupied and showing no signs of human presence.

"Almost ninety thousand people," Manx said, to Wolf's question. "The Harvester is a major population center of the Outer System. About ten million service machines, I imagine, though no one keeps count. They make whatever new ones they decide they need, it has been that way since the first ones were sent here from the Inner System. I've sometimes wondered what the machines would have done if people had never arrived in the Cloud. Would they have eventually downed tools and quit, or would they have found some other justification for continuing to modify the Cloud? If there were no humans to use the biological products of the Harvesters, would the machines have found it necessary to invent us?"

To Bey's relief, they had reached a region of noticeable gravity. He was not too keen on the other implications of that—a shielded kernel had to be somewhere near, and that much pent energy made him uncomfortable. But it was nice to have an up and a down again, even if it were only a twentieth of a gee. He followed Leo Manx through a final door, on into a long room with a curved floor.

Three Cloudlanders were sitting at a little round table, each dressed in the

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uniform of a lemon-colored one-piece suit.

Wolf at once recognized the woman facing him. Given the frequency with which she appeared on Earth newscasts, it would be hard not to do so. Cinnabar Baker was one of the three most powerful people in the Outer System, and a scathing critic of everything that happened closer to the Sun than the inner edge of the Cloud. Her cheerful appearance belied her reputation. There was presumably the thin, gravity-intolerant skeleton of the Cloudlander within her, but in Baker's case it was well covered. She was a vast, smiling woman, maybe two hundred kilos in mass, with a flawless, pale skin. Her hair was thin and close-cropped, revealing the contours of a well-shaped and delicate-looking skull. The clear eyes and fine skin tone gave evidence of regular use of form-change equipment.

She stood up and held out a chubby, dimpled hand. "Welcome to the Outer System. I am Cinnabar Baker. I'm responsible for the operation of all the Harvesters, including this one. Let me express my appreciation that you agreed to come here, and allow me to introduce you to some of my staff. Sylvia Fernald." She gestured at the woman on her left. "In charge of all software development and control theory in the Outer System. Next to her, Apollo Belvedere Smith—Aybee for short and for preference—my top science advisor and general gadfly. Leo Manx, senior psych administrator and Inner System specialist, you know already—probably all too well after your trip together from the Inner System."

"Behrooz Wolf," muttered Bey. It hardly seemed necessary. They knew who he was. How many hairy strangers were there on the Harvester, a foot and a half shorter than everyone else and with four times the muscles? Bey greeted the others, making his instinctive and immediate assessment of their ages, original appearance, and major form changes. There were anomalies, points to be thought about later, particularly in the case of Apollo Belvedere Smith, who was extra tall, rail-thin, and glowering angrily at Wolf for no discernible reason. But for the moment Bey was pondering a more substantial question.

Cinnabar Baker was here, with three of the Cloud's scientists, technicians, and administrators, all apparently tops in their fields. They had been summoned to worry a technical problem of malfunctioning form-change equipment. Wolf had come to know and like Leo Manx, with his quirky sense of humor and his shared interest in Earth history and literature. He felt that a perfect choice had been made, Manx was just the right combination of seniority, experience and intellect to work with Bey on form-change questions. But the others? It made more sense for Bey and Leo Manx to go straight to work. Why a top science advisor? Most of all, why Cinnabar Baker? She was far more senior than the problem justified.

Bey felt the stir of an old feeling, something that had been dormant for too long within him: suspicion—and with it, the *frisson* of powerful curiosity.

"Sylvia Fernald and Leo Manx will be your principal day-to-day contacts," Baker was saying. "If you find it necessary to travel through the System, one or both of them will accompany you.

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Aybee usually travels with me, and I have to be all over the place; but you will have first call. Any time you require him, he's at your service. That's enough, Aybee''—the man across the table had grunted his disapproval—''I told you the rules. Tell us what you need to know about our form-change programs, Mr. Wolf, and we will do our best to provide it.''

Wolf sat down between Leo Manx and Aybee Smith. He wanted to see more of the Harvester, but that could wait. It was time for a direct approach. ''Naturally, I would like an overview of the problem you've been having with form-change equipment and programs. But that's not my first priority.''

They were staring at him in surprise.

''I'd like to know what's going on here,'' he continued. ''I don't think I have been given the full story. There are factors that have not been described to me.'' He caught Cinnabar Baker's quick look at Leo Manx, and the other's tiny shake of the head. ''I must know what they are.''

Apollo Belvedere Smith gave a grunt of approval. ''Hey. I didn't want to bring you here, but mebbe you can do something useful after all.'' He turned to Baker. ''Was I right, or was I right? He cottoned. I guess I should brief the Wolf-man.''

Cinnabar Baker shook her head. ''You'll go too fast and leave too much out.''

''Naw. If he's smart as he needs to be, he'll follow.''

''Maybe. But it's still no. You can impress him with your brilliance later. I want Fernald to brief him. But before we begin.'' She stared straight at Bey, and he saw past the fat, friendly exterior. Cinnabar Baker was a person with drive to match her bulk, a woman who made up her mind in a hurry. ''I won't ask you to pledge secrecy when you go back home, Behrooz Wolf,'' she went on. ''Just don't talk about this while you're around here. We want to minimize alarm—panic, if you prefer that word. Now I'm starting to sound mysterious. Go on, Fernald, let's have it. Tell him what's been happening.''

''Everything?''

''The whole story.''

While they were talking, Bey had taken a closer look at Aybee Smith. His appearance suggested a man in his early twenties, but that of course meant little. Bey listened, looked, integrated posture, speech style, and the exchange between Aybee and Cinnabar Baker, and came up with a surprising conclusion: Apollo Belvedere Smith was a teenager, still under twenty. Yet he was Baker's top science advisor. Which meant he had to be at least half as smart as he seemed to think he was.

''Background first.'' Sylvia Fernald had moved around to face Bey. She was a good and logical briefer, and she began with a summary of what Bey had already heard in fair detail from Leo Manx. Three years ago there had been problems with form-change processes. Humans emerged from the tanks either with an incorrect final form, or in just the same state as when they went in. The problem had not attracted much interest at first, since a repeat of the form-change process would always lead to the desired result.

That had become less true in the past two years. Deviations became more pro-

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nounced, and repeat treatments often led to new anomalies. One year ago the first deaths had occurred in the form-change tanks. Every attempt to trace the problem had failed. The numbers of deaths and abnormalities were now growing exponentially.

Wolf was hearing little that was a surprise, and his main attention was concentrated on the speaker. Sylvia Fernald had chosen neither the walking skeleton of Leo Manx, nor the roly-poly bulk of Cinnabar Baker. She was slim, but not skinny, and incredibly ugly by Earth standards. She towered over Bey by a foot or more, with a gawky, angular build that seemed all spidery arms and legs. Like Baker, she wore her carroty-red hair short, swept back from a high, pale forehead. But unlike the others at the table she had eyebrows, pale sandy arches that emphasized the size and brightness of her deepset grey eyes and the sharp angle of her thin, jutting nose. Bey ignored the overall unpleasant impression, did his usual summation of variables, and decided she was on the young side of early middle age.

"How many cases, total?" he said, when she paused.

She hesitated, and looked at Baker who nodded. "Tell him."

"Nearly eighty thousand."

"My God. That's more than we've had on Earth in a century and a-half."

"I know. And remember, that's out of a total population of fifty million, not your fifteen billion."

"And getting worse. Can you provide me with the rates of change?"

Sylvia Fernald nodded, after another quick look at Cinnabar Baker. "That's not the end of it, Mr. Wolf. I'm not an expert on the technology of the Inner System, but here our form-change systems, hardware and software, are the most delicate devices we have. They have to be shielded against interference, and there's triple redundancy and error-checking in every electronic signal."

Bey nodded. "Same on Earth. I'd be amazed if the procedures and the error-correcting codes are any different. I don't see how they could be. Form-change won't tolerate transmission errors. It's so delicate that an error rate of one bit in ten to the twelfth is enough to show. Nothing else comes close in sensitivity."

"Not on Earth, perhaps," said Cinnabar Baker. "But remember, here in the Outer System we are far more dependent on all kinds of feedback control systems. Go on, Fernald. The whole story."

"Three years ago we had our first problems with form-change processes. That was bad. But two years ago, other things began to go wrong. On a big scale. There are now billions of tons of hydrogen cyanide floating free near the edge of the Halo. The whole product line from the Kuiper Harvester went sour on us. It was supposed to produce aldehydes and alcohols from pre-biotic bodies in the Cloud, but the program went wrong, the automatic checks didn't work, and the first thing we knew was when a crewed surveyor reported anomalous spectral signatures."

"A year's production down the drain," added Baker. "And five years more work before we'll be able to clean it up."

"Another Harvester is producing the wrong materials," said Sylvia Fernald.

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"We caught that early, with no damage. We're busy now, checking the other thirty. We've also had signs of instability in a kernel control system; gigawatts of raw radiation if one of those got away. And oddest of all, nonsense reports have been coming in from our remote monitoring systems. They're scattered all over the System. Either our communications are generating batches of spurious signals, or space in the Outer System is filled with bizarre . . . things."

"Things?"

Aybee Smith produced a humorless laugh. "Yeah. Things. Tell him, Sylv."

"Visual phenomena." Sylvia Fernald was clearly uncomfortable with her own words. "Impossible events. I don't believe in them, myself, but the people who report them do."

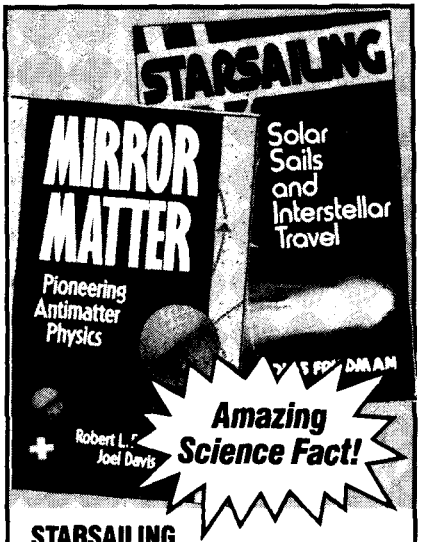
"Come on, Sylv—you're stalling." Aybee Smith grinned fiercely at Wolf. "How about a Space Dog—a blood-red hound running across Sagittarius, filling five degrees of the sky? It was reported from Spanish Station, on the other side of the Sun. Would you believe that?"

"No, I wouldn't." Wolf looked at Cinnabar Baker, but her face was serious and she showed no sign of interrupting. "It's ridiculous."

"Right. So how about a flaming blue sword, down near the edge of the Halo? Or a rain of blood, sleeting across Orion. Or a great snake, wrapped around the Kernel Ring and swallowing its own tail?"

"How many people reported seeing these?"

"People?" Aybee Smith shook his head in disgust. "Wolf-man, people will see anything. If it was just *people*, I'd say the hell with it, they're crazy.



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But these were *instrument* readings. Sensors *recorded* this stuff. People only saw it later, when they looked at the files. We're talking serious here, not just crazy. You know what a lot of the people who've seen this say? They don't say phenomena, they say *portents*. How do you like that?"

Bey was listening, but half his attention was elsewhere. Again, something was not adding up. It took a few seconds to recognize what it was, and turn again to Cinnabar Baker. "This has been going on for years?"

"More than two years. But getting worse, bit by bit. It sounds like nonsense, I know, but with everything else going on I have to take it seriously." She paused. "You're sceptical. I'm not surprised. But believe me, neither Sylvia Fernald nor Aybee is exaggerating or inventing."

"I do believe you. But I think we're still both playing games. Let me tell you something you may not care to hear." Wolf nodded at Leo Manx. "When he asked me to take a look at your form-change problems, I refused. Then an hour later I called him up, and agreed. So why did I change my mind? I'm not an idiot, even though you may think I act like one. Well, I left Earth because I knew that if I didn't, I'd be back in Old City in less than a week. I came to a place where I couldn't do that, even if I wanted to. I was going crazy there—maybe I'm still going crazy."

"I do not agree." Leo Manx sounded comfortingly confident.

"We'll see. Either way, I didn't feel I was cheating you. Crazy or not, I know form-change theory and practice as well as anyone. So I would get away from Earth, and maybe lose my hallucinations, and maybe you would get help with your problem. That would be a fair exchange. Except that you haven't been honest with me. You're having trouble with form-change, sure, but now you're admitting your problem is much more general. *All* your signals and communications are screwed up. Form-change just happens to be unusually sensitive to it."

"That is probably correct." Cinnabar Baker was not embarrassed.

"So now let's look at things from your point of view. I know form-change, but I sure as hell won't solve your other problems. You ought to have experts in bifurcation theory, in optimal control theory, in signal encoding and error correction, in catastrophe theory. Those are not my fields."

"I agree."

"So why don't you get the right people, people who already know the Outer System?"

"For this reason." Cinnabar Baker gestured to Aybee Smith, who took a thin card from his pocket and passed it to Bey. "Do you recognize any of those names, Mr. Wolf?"

Bey scanned it briefly, noting his own name halfway down. "I know two-thirds of them. You're certainly on the right track. The ones from the Inner System are top people. If the ones from here are comparable, you've got the best systems talent of the Solar System on that list."

"I'm glad you agree with Aybee's judgment. He made the list, it's good to know he gets something right." Baker waited for Apollo Smith's indignant snort, then continued. "We tried

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to obtain the services of all those people. Every one."

"And they refused to help? I'm surprised, if you told them what you've just told me."

"No, Mr. Wolf." The real Cinnabar Baker was showing through, powerful and deadly serious. "They did not refuse. They had no opportunity to do so, because we had no chance to tell them. Of the twenty-seven names on that list, twelve are dead. Seven are hopelessly insane. And seven have disappeared. Our attempts to trace them, assisted when appropriate by officials of the Inner System, have all failed. That makes twenty-six. You, Mr. Wolf, are the twenty-seventh."

She stood up slowly, a massive and massively-determined woman. "And now I am holding nothing back from you. You know what we know, except for the details. Do you agree with my view, that you have special motivation to work on and solve this problem?"

CHAPTER SEVEN

"The emitted particles have a thermal spectrum corresponding to a temperature that increases rapidly as the mass of the black hole decreases. For a black hole with the mass of the Sun the temperature is only about a ten-millionth of a degree above absolute zero. The thermal radiation leaving a black hole with that temperature would be completely swamped by the general background level of radiation in the universe. On the other hand, a black hole with a mass of a billion tons would release energy at the rate of 6,000 megawatts, equivalent to the output of six large nu-

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clear power plants.''

—Stephen Hawking (1942-).

The builders, caretakers, and first inhabitants of the Harvesters worked around the clock, without thought of rest. Bey Wolf was beginning to wonder if the human occupants were expected to follow the same schedule.

When the conference with Cinnabar Baker was over he had been settled into a huge but pleasant set of rooms complete with form-change unit and extended library access. Leo Manx, who took him there, pointed out that the quarters provided a fortieth of a gee sleeping environment. He obviously expected Wolf to be delighted. Bey, knowing that the source of the local gravitational field could only be a power kernel, no more than thirty meters below his feet, was not pleased. The triple shielding on a Kerr-Newman black hole had never failed—yet; but according to Sylvia Fernald, several in Cloudland had recently come close. At thirty meters, a few gigawatts of hard radiation wouldn't just kill him; it would dissolve him, melt his flesh from his bones before he knew what was happening.

Bey was tired by the journey and the novelty of the Harvester, and glutted with new information. He wanted to lie down for a while and digest what he had learned; but Leo Manx showed no signs of leaving.

''Sylvia Fernald and Aybee Smith will both be excellent colleagues,'' he said. He had stretched himself out on Bey's bed, just lengthy enough for him, and closed his eyes. ''But there are things about them that you should know before we begin. Aybee is extremely able, but a little immature.''

A very comfortable bed, apparently. Bey coveted it. ''He's just a kid.''

''Exactly. Nineteen years old, but more knowledgeable and scientifically creative than anyone else in the Outer System. You may rely on him for science, but not for judgment.''

''I'll remember. What about Sylvia Fernald?''

''She is more mature and also more complex. Her judgment on some of the subjects we discussed today may not be sound.''

''Fifty-five years old?''

Manx lifted his head from the bed to stare at Wolf. ''Fifty-six, as I recall. Are you able to do that with anyone?''

''I don't know. Probably. I've had lots of form-change experience. Why is she suspect?''

''You saw the list of names of people who died or disappeared. One of them, Paul Chu, was Sylvia's consort for many years. I believe they planned to become parents. But he vanished without a trace six months ago, on a routine trip to the edge of the Halo.''

''The Halo again.''

''I know. I have had the same thought. But without evidence . . .''

''We'll have to look for evidence.''

''Certainly.'' Manx lay silent, eyes closed, for another minute or two. He sighed. ''You know, I was originally very doubtful about my trip to Earth; but it was a very good idea. Before I went, I always suspected that deep inside I was by nature an Earthman. Your history is so fascinating, and Earth is the origin of all the worthwhile cultures and arts. But not until I had made a journey there for myself did I realize that it was not for me. It was not home.

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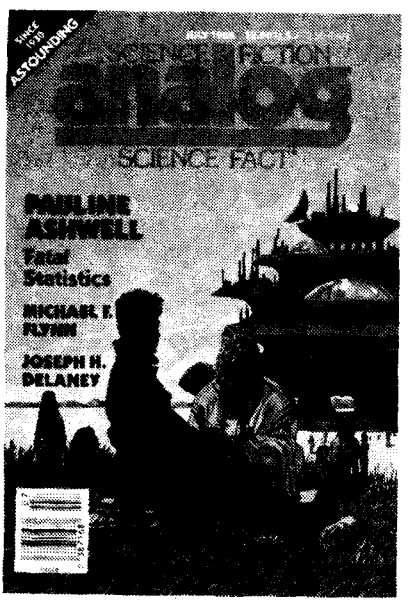

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This is home." He patted the bed and lapsed into another and longer silence.

"I think I'll have a sign made for that far wall," said Bey at last.

"Indeed?"

"Yes. It will say, 'If you have nothing to do, please don't do it here.' "

Manx frowned and opened his eyes. "You wish for privacy?"

"I wish for sleep."

Manx sat up reluctantly. "Very well. Then I will leave. But I must mention one other matter of importance to you. I have completed my analysis of your own difficulties."

Fatigue changed to a tingle of anticipation. "The hallucinations? You think you can stop them?"

"No. On the contrary, I am sure I cannot. Because I am convinced that what you have been seeing are not the distorted constructs of your brain. They have been imposed from *without*."

"That's impossible. I've been in situations where I saw that Red Man, and there were other people watching the same broadcast. They saw nothing. I've seen him on a recorded program, too, then played the same program through a second time. He didn't reappear. And anyway, why would anyone *want* to make me crazy?"

"I don't know. However, I believe that if we can answer the first problem, of *method*, we will have gone far towards answering the second one, of intention. And an induced effect is a *technological* problem, not a psychological one. That offers us recourse. I propose to present the idea at once to Apollo Smith. If I know Aybee, it will intrigue him." He levered himself off the bed, sighed, and nodded to Bey. "And so to bed. Sleep well."

Which, of course, Leo Manx had now made out of the question. Bey turned off the light and lay on the bed (Manx had known what he was doing, it was extremely comfortable), but he no longer felt sleepy. *Induced effects*. He had considered that idea when the Dancing Man had first appeared, but he had dropped it for two good reasons: he could not see how it might be done, and he could not imagine why anyone would want to do it.

After five useless minutes, during which he again concluded that he knew of no way to turn Leo Manx's opinions to useful facts, Bey rose, dumped his clothes into the service hopper, and went through to the shower room. It was sinfully big, the size of a five-person apartment on Earth; no wonder Leo Manx had been crowded there. After a minute of juggling with unfamiliar controls, Bey ran the water as hot as he could stand, then accidentally switched it to an icy downpour. He jumped out of the spray with a scream and turned on the hot air.

As soon as he was dry he realized he had made another mistake. The only clothes offered by the dispenser were more of the pale yellow one-piece suits, too long and too narrow for his body. His own clothes had been eaten by the service hopper, and he could find no sign of shoes anywhere.

Finally he stuffed himself into one of the suits and managed to engage the fasteners. Looking at himself in the mirror was an unwise decision, but he suspected he was already as ugly as he could get by Cloudland standards. Bey

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left his quarters barefoot, and headed along a corridor that spiralled slowly away from the kernel. He had no idea where he was going, but he felt confident that he could find his way home. There was not likely to be another kernel in the interior of the Harvester, and as long as he followed the kernel's gravity gradients "up" and "down" he could not get lost.

After a few minutes of wandering he found himself in a broad accordion-pleated passage that was pouched and folded like the alimentary canal of some giant beast. That similarity went beyond appearances. Bey knew that the Harvesters prowled the Oort Cloud, seeking bodies high in volatiles and complex organic materials. Once found, these were ingested by the comet-sized maw of the Harvester, for transfer to the interior. They were heated with energy extracted from the power kernel, thawed, and dropped into the internal lake-sized vats, to be stirred and aerated by jets of carbon dioxide and oxygen. In that enzyme-seeded brew, the pre-biotic molecules of the fragments—porphyrins, carotenoids, polypeptides, and cellulose—were converted to edible fats, starches, sugars, and proteins.

Bey stood by a viewing port and peered into a bubbling sea of pale yellow-green. Close by him, there was a shudder of moving machinery. A great valve had opened. Hundreds of thousands of tons of broth went streaming along helical cooling tubes, on the way to extraction of water, chlorophylls and yeasts. This batch was near its final stages. Most of the final product would be compressed, packaged into space-proof containers, and launched on the long journey to the Inner System. The Harvesters fed the population of the Cloud itself, but more important, their products were essential to the survival of everyone closer to the Sun. The same food products were the working capital that funded the outflow of technology and finished goods from the teeming Inner System.

And if there were a war, or an embargo? As Bey left that enormous production plant, he could not help wondering what would happen if the supply line failed.

At first, nothing would be noticed at the destination. The payloads were transported to the Inner System at only a fraction of a gee acceleration, so they took a long time to get there. There would be food in the pipeline of the delivery system for at least ten years, even if the supply from the Harvesters was cut off today. But then the Inner System would be in real trouble—as much trouble as the Cloud would suffer, if the Inner System were one day to cut off the supply of power kernels, or to refuse to ship out manufactured goods. With such total inter-dependency of the two groups, any talk of war or of breakdown of commerce between them seemed ludicrous. And yet Bey knew that such talk was more and more common, more and more strident.

He had followed the local gravity vector downwards, and now he was almost back at his quarters. But the thought of the Kernel Ring led him to keep going, descending a steep staircase that dropped toward the kernel itself. Within fifteen meters he found himself on a black, seamless sphere, with no visible entry points. He was standing in

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a thirtieth of a gee field, on the first of the three kernel shields. Nothing organic would survive for a millisecond on the other side of it. Twenty meters or less beneath his feet was the kernel itself, a rapidly rotating black hole held in position using its own electric charge. This one would mass a couple of billion tons. It served as the power source for one whole sphere of the Harvester. Streams of subnuclear particles passed through the kernel's ergosphere, slightly slowed the kernel's rotation, and emerged with their own energy vastly increased.

The power provided by a kernel was large but finite. After maybe twenty years, its angular momentum and rotational energy would be depleted. A "spun-down" black hole with no rotation would continue to radiate according to the Hawking evaporative process, but that energy was far less controlled and useful. It was even a nuisance, since the monitor sensors within the shield needed multiple signal redundancy to assure error-free messages to the outside. A spent kernel was a useless kernel. It had to be "spun up" again to high angular momentum from some other source, or replaced by a new one from the Kernel Ring.

And if the Kernel Ring became inaccessible? Then the Cloudlanders would starve for energy, as surely as the Inner System would starve for lack of Cloudland food supplies. And yet the Kernel Ring was the least controlled part of the whole System, and it was not clear who had the most rights to it. The Podders, the Halo's migrant spacefarers who lived within their spacesuits? Or maybe it was Black Ransome, waging war against both Cloudlanders and Sunhuggers from the mystery hideaway of Ransome's Hole.

Bey found the train of thought leading him again to Mary. Was she in the Kernel Ring, as Leo Manx insisted. Or was she to be found somewhere *here*, in the unthinkably big volume of the Cloud? If so, the Cloud's central library system might help him to locate her. Assuming that he wanted to.

"*Since there's no help, come let us kiss and part. Nay, I have done, you get no more of me.*" Mary's last message had asked him not to look for her, but in typically Mary terms. She had left an opening for ambiguity. Bey turned to head back for the stairs, thinking that if he started to learn the library access system now he would never get to sleep.

He was so preoccupied with his thoughts that he almost walked into the three strangers.

There were two men and a woman. Wolf had time for no more than a quick look at them (again, no eyebrows, and suddenly that made sense; perspiration would not trickle down foreheads in zero gee). Then they were advancing on him.

"What the devil are you doing here?" The shorter of the men spoke loudly and angrily. He came close and glared down from his superior height.

"I'm sorry," began Bey. "I didn't know the kernel level was restricted territory. I was about to—"

"The kernel level!" The man turned to his companions. "Just like a Snugger, he doesn't understand what you say to him."

The woman stepped forward. "We're not talking about the kernel. You don't belong on the Harvester—or anywhere

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in our System. You get back to your own stinking kind."

The other man did not speak, but he stepped to Wolf's side and jabbed him painfully in the ribs with a bony elbow. At the same moment the woman trod on Bey's bare instep with a hard-soled shoe.

"Hold it now—" Bey took a step backward. They were in a low-gee field, which favored the Cloudlanders, but Bey was sure that if he had to defend himself he could do it very well. He could break any of those thin limbs between his hands, and their feeble muscles had probably done as much as they could to hurt him. But he didn't want to fight back—not when he had no idea who or why. He lifted his arm as though to strike at the man in front of him, then instead lunged for the staircase.

He was all the way up before they had even turned to pursue. At the top he slammed the door in position and raced off along the corridor. On the threshold of his own quarters he ran into a tall figure coming out. Bey braked as hard as he could, but there was still contact. The man gave a grunt of surprise and went sailing away through the air, bouncing off the wall and then falling facedown across the bed.

"Hey! What the hell!"

Bey recognized the complaining voice. It was Apollo Belvedere Smith. He went across and helped him to sit up.

Aybee rubbed his midriff. "What's all that about?"

"I was going to ask you the same. I was running away from three of your people. I've no idea who they are, but they tried to start a fight."

"Oh, yeah. I came here to warn you not to leave your quarters. Close the door, Wolf-man, and lock it."

"Why? What the devil's going on here?"

"You're the man they love to hate." Aybee stood up and began to wander around the room. "You didn't hear the newscast, right?"

"I've been looking at the inside of the Harvester."

"Yeah." Aybee was still scowling, but it was apparently his natural expression. "You know something, most people are real idiots."

"Not true. By definition, most people are average."

That earned a quick grin. "Y'know what I mean. They're animals. Last few days there's been more growling and scowling between government here and government in the Inner System than you'd believe. So in comes news a couple of hours ago from the far side of the Cloud. Bad deal. A whole Harvester destroyed, blown apart, thirty thousand people dead. Power plant went blooey. And newsword is that you Sunhuggers did it."

"Nonsense. The Inner System would never destroy a Harvester. We need that food."

"Hey, I never said I believed it, did I? It's like I said, people here are dumb. They see somebody looks like you"—Aybee paused to give Bey a detailed inspection, then shook his head and went on—"they hate him. You're not safe here now."

"That's Cinnabar Baker's problem. If she wants me to be useful, she'll have to find a way to give me working space."

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The answering grin was even less pleasant than usual. "No worries. You'll get work space, Wolf-man. The other thing on the news is just your line. Form-change foul-ups on the Sagdeyev space farm, a day from here. You and Sylv'll be heading there, see what you can sort out."

"You won't be going?" Bey wanted to know how important this was in Cinnabar Baker's mind.

"Don't think so. Not 'less you need me. Sylv can handle it. She's no dummy, and she's reliable. You'll like working with her."

It was probably the highest level of praise that Aybee offered to anyone. Bey nodded. "I have the same feeling. We'll get on together."

"Mind you, she's no good at *real* science. She comes to me for that."

"You're too modest."

"Mebbe I am." Aybee was examining Bey with a look of clinical curiosity. "Mind if I ask you a personal question?"

"Probably."

"Do you have hair like that all over? I mean, it must drive you crazy."

Bey held up his hand to show Aybee the open palm.

"OK. You know what I meant." Aybee grinned. "You think I'm a smart-ass, don't you?"

"Not at all. Fifty years ago, I was just like you. Brighter than fusion. I'm amazed how much smarter people are these days."

"Senile decay?"

"Hang in for a little while. Your turn will come."

Aybee scowled. "Hey, Wolf-man, don't say that. That's too true to be funny. Top mathematicians and physicists do their real stuff before they're twenty-five. After that they're just hacking. I've only got six years left, then it's all downhill for the next hundred years. How's it feel to be real old?"

"I'll let you know when I am."

"Sylv says you're pretty well along—after the meeting she got Manx to let her peek at your personal records. She's nosey. She tells me you been seeing things, and you don't know how you could have been fed 'em. And the Manx-man thinks I could help. Tell me more."

"Not tonight, Josephine."

"Who?"

"Somebody even older than me." Bey advanced slowly on Aybee. "Shoo. You're leaving now. I'm going to throw you out—literally, if I have to. Catch me in the morning, I'll tell you all you want to know about me. Even how I grow hair."

"Sure." Aybee headed for the doorway. "I guess old people need lots of sleep."

"I guess we do." Wolf closed and locked the door after him. If any more visitors were on their way tonight, they would have to break it down. He sat on the bed and considered Apollo Belvedere Smith.

Aybee was young, arrogant, opinionated, brash, and insensitive.

Bey liked him very much.

CHAPTER EIGHT

Cinnabar Baker had no home, or perhaps she had thirty. Apartments were maintained for her use on every Harvester, identical in size, gravity, and furnishings. She traveled constantly,

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and spent at most ten days a year in each one.

She was said to have neither human intimates nor personal belongings. Turpin went with her everywhere, but he was not a possession. He was an old, cross-eyed crow with a big vocabulary and an absence of tail-feathers. When he was in a bad mood, which was often, he had the habit of tugging plumage out with his bill.

He was doing it now, and it was an unpleasant sight. Sylvia Fernald found it hard to take her eyes off him. The crow would pause occasionally to glare at her with rheumy, droop-lidded eyes, then go back to his self-destructive preening. He made no attempt to fly; instead he went waddling back and forth in a piratical roll all over the little round table in front of Sylvia, wings half-open and muttering a bad-tempered parody of human speech. Sylvia tried to ignore Turpin and keep her attention on what Cinnabar Baker was saying. It wasn't easy. Sylvia had been asleep when the call came. She bit back a yawn, wondering how it was possible to be so nervous and yet so sleepy.

The latest summons had caught her by surprise, as had the earlier order, a week before, to attend the meeting with Wolf and help to brief him. She worked for Baker, that was undeniable, but the boss of the Harvesters had reached down past two intermediate levels of command to get to Fernald, and she had never offered any explanation.

This new call had been equally casual, as if there were nothing unusual in asking a junior staff member to come to a one-on-one meeting well after midnight. The big woman had been sitting cross-legged in the low-gee apartment when Sylvia arrived. She had exchanged the yellow uniform for a billowing cloud of pale-green spun material that left only her head and hands uncovered, and she seemed as fresh and alert as ever.

"Now let's think a bit more about Behrooz Wolf," she said, as though continuing a conversation already in progress. "We have Leo Manx's impressions, of course, and I have now heard from Aybee. But neither one is a close observer of what I might call inner states. You saw as much of Wolf as I did. What sort of man did you find in there?"

Sylvia had expected a discussion of Harvester control systems, or perhaps of form-change procedures. Her job did not include character assessments; but she could not tell that to Cinnabar Baker. And she was fairly sure that Baker could not be stalled with platitudes.

"Competent but complicated. I don't think I was ever sure what he was thinking."

"Nor did I." Baker smiled like the Gautama, and waited.

"He's obviously intelligent, but we knew that from his reputation. And I don't just mean for form-change theory. He saw that there were other matters involved here very quickly."

"Almost too quickly." Cinnabar Baker did not elaborate. Again she sat and waited.

"And he's obviously a sensitive type, too. I saw Leo Manx's reports on Wolf, and his relationship to Mary Walton." (And I can imagine how he felt when she left, but I won't say that to Cinnabar

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Baker.) "That means he's still very miserable, and thinks he's not getting much out of life. But he took a lot of interest in what we told him; so I suspect that although he *believes* he feels things strongly, his intellectual drives are more powerful than his emotional ones. He's like Aybee, he lives in a thought world more than a sense world. He wouldn't admit that, maybe he doesn't even know it. As for his other interests, it's hard to say anything. How does he spend his time when he's not at work?"

While she was speaking, Sylvia found herself asking the same question about Cinnabar Baker. This apartment was tiny by Cloud standards, and minimally furnished. The walls were a uniform beige, unrelieved by pictures or other decorations, and there were no personal bits and pieces like the ones that filled Sylvia's own apartment to overflowing. Cinnabar Baker had a reputation for hard work. On the basis of the evidence, work was all she had.

"Did you find him attractive?" The question was so unexpected that Sylvia was not sure she had heard correctly.

"You mean, *physically* attractive?"

"Exactly."

"My God, no. He's absolutely *hideous*." Sylvia let that answer sit for a couple of seconds, then felt obliged to add, "I mean, I suppose it's not his fault, lots of people from the Inner System probably look like that. And he has an interesting mind, and I think he has a good sense of humor. But he's revolting looking, and of course he's very little, with those short stubby arms. And worst of all, he's . . . he's too . . ."

"Too?"

"Too *hairy*. I wouldn't be surprised if he's covered with hair all over him, like an ape, everywhere. Even on . . . Of course"—Sylvia suddenly became aware of how extreme she must sound—"I suppose he can't *help* any of that. Though with form-change equipment available . . ."

"I'm sorry you find him a little unattractive." Cinnabar Baker apparently had a great gift for understatement. She was reaching out to stroke the back of the crow standing in front of her, and looked down so that her eyes were hidden from Sylvia. "You see, I wish to make an unusual request of you. And since it's outside the usual range of duties, it has to be no more than an informal request."

"If I can do anything to help you, naturally I will." (The day had been crazy so far. Could it get any stranger?)

"Good. You know that you will be working closely with Behrooz Wolf, and traveling with him?"

"That's the plan."

"I want you to seek a relationship with him. A very close relationship."

"You mean—you want me to—surely you don't want me to—" Turpin chose that moment to give a long, gurgling laugh, like water flowing away down a drain, and Sylvia could not finish the sentence.

"I mean a psychological attachment," said Baker calmly. "If it turned out to be a physical relationship, so much the better. And I'll tell you why. Wolf was one of twenty-seven people we considered contacting to help us. He's the only one left, so we tend to say to ourselves, hey, he was really lucky. Maybe he *was* lucky. But maybe there's more than luck involved. Maybe Wolf

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knows more than he admits, and maybe there's a good reason why he didn't get wiped out with the rest. And some reason why he agreed to come here, after first refusing. If so, I need to know all that. Pillow-talk is better than truth drugs. If you could get close to him, persuade him to confide in you—"

"I can't do it!" Sylvia hadn't listened to anything past Baker's first sentence. "It's out of the question. I'll do most things, but that's too much to ask *anybody*."

"Maybe it is." Baker stopped stroking Turpin's back and fixed cool blue eyes on Sylvia. "I feel sure that the feeling is mutual. Wolf undoubtedly finds you no more desirable than you find him."

"I'm sure of it. You've seen Snugger women. Short and brown, all fat and hips and breasts. He must think I'm hideous. My God, I'm a foot taller than he is, if I'm an inch. And miles too skinny for Earth taste. And anyway—"

"Anyway," said Turpin suddenly. "Anyway, anyway, in for a penny-way." He took off with an excited flapping of black wings, flew up and around in a lurching spiral, and landed leering on Cinnabar Baker's shoulder.

"You underestimate the effects of prolonged personal interaction," Baker was saying. She smiled. "In other words, talking leads to touching. And beauty is easy. A few hours in a form-change tank—not that I'm suggesting this, you understand—and you could be Wolf's ideal of beauty."

"Never. I'm sorry, but I won't even consider it. That's final." Sylvia stood up. She should leave as soon as possible, before Cinnabar Baker could try again to talk her into something.

And so much for her own career as control specialist—her now-blighted career. It had been ruined in the past five minutes.

The last thought was the bitterest of all. When the original summons had come from Cinnabar Baker, Sylvia had been flattered and excited. The quality of her work must have singled her out for special attention. She would be assigned to the visitor from the Inner System because she had unusual competence in form-change and systems work.

Now it was clear that her professional skills had nothing to do with it. Her role was that of convenient female, a lure set out to catch Bey Wolf. And now she had refused? Cinnabar Baker might say she did not hold it against her; but she would. Sylvia's career was in tatters.

"Please excuse me now." She looked at Baker, found no words, and headed blindly for the door.

Cinnabar Baker watched her leave. As expected, Sylvia Fernald had refused—vehemently. But the idea had been planted. Now Sylvia would be unable to meet and work with Behrooz Wolf, without also evaluating him at some level as a prospective partner. And that was all Baker had hoped to achieve.

"Hormones are everything, Turpin," she said to the bird on her shoulder. "Brains are nice, and looks are nice, and logic's even nicer; but hormones run the show. For everyone, even for me and you. But we never know it. I hope I wasn't too hard on Sylvia. Let's see if she'll change her mind when she knows him better."

The night's work was far from over.

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Humming softly to herself, Cinnabar Baker bent over the desk-top communications unit and reviewed the official statement she had prepared warning the Inner System about their interference in Outer System affairs. It would do. There were a couple of key words that could be stronger—"demand" instead of "request," and "intolerable" was better than "impermissible"—but they were easily fixed.

She approved it for release. Then she entered coded mode and requested a dedicated circuit for new, real-time communication. There was a moment's delay pending approval of heliocentric coordinates outside the usual network. That was cleared, using Baker's own authorization. The scrambling codes were assigned. Finally, on the outermost structures of the Harvester, the half-kilometer antenna turned its focused hyper-beam towards a destination deep in the Halo.

CHAPTER NINE

"You can run, you can run, just as fast as you can,
You'll never get away from the Negentropic Man."

Cloudland ships were easy to recognize: hydrocarbon hulls, bracing struts of carbon fiber, transparent polymer ports.

Necessity and Nature had set the rules. The bodies of the Oort Cloud provided a limited construction kit, little but the first eight elements of the periodic table. Metals were in particularly short supply. Rather than dragging those up the gravity gradient from the Inner System, the Cloudlander fabricating machines had learned to improvise. Less than one-tenth of a percent of the ship that would carry Bey Wolf and Sylvia Fernald to the Sagdeyev space farm was metal, and that fraction would be reduced again in the new models.

Wolf was trying to hold a conversation with Sylvia Fernald as they prepared to leave, but it was difficult going. Two days ago she had been friendly and at ease with him. He had known it and so had she. They were strangers, but they had hit it off together in the first few minutes, comfortable with each other's work style and attitude. He had been pleased at the prospect of working with Fernald—Sylvia, she had asked him to call her that before the meeting ended. But today . . .

Today he had been wringing words out of her, one by one: "This looks as it will only hold two people. What about Leo Manx, Sylvia? I thought he was planning to come with us."

"He changed his mind." Her voice was expressionless. She was staring at the fine black hairs on his forearm, and refusing to look him in the eye.

Was *that* it? His appearance? When he had arrived at the Opik Harvester, Bey had been wearing the long-sleeved, long-legged style of the Inner System. Today he had adopted the scanty uniform of the Cloudlanders, and his physical differences were more apparent. The widespread use of form-change equipment had allowed Earth people to get used to pretty much anything. But the people he had seen here on the Harvester were all very similar, limited thin-or-fat variations on a single body type.

She had turned to check fuel and supply status, and was bending low over

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the panel. He moved closer to her, reaching out a muscular arm and stealthily comparing it with her pale, smooth limb. She sensed he was near her, and spun around.

"What are you doing?"

"Nothing." Bey wondered why he sounded guilty, and why her cheeks were flushed. If she stayed as jumpy as this for the whole trip, it was going to be an unpleasant twenty-four hours. The one accommodation shortage in Cloudland was found in their transit vessels. The McAndrew drive was fine, but the inertial and gravitational forces were balanced only in a small region on the ship's main axis. Bey and Sylvia would share that space, a cylindrical cabin about seven feet across. Standoffishness would be hard. Sylvia herself was close to seven feet tall.

They were making final preparations for departure, running a countdown together with awkward formality, when Aybee hurried in.

"Good. Thought mebbe I'd missed you."

"Four minutes more, you would have." Sylvia did a poor job of hiding her relief. "Are you coming with us?"

"No way." Aybe looked around the little cabin in disgust. "I need *space*, room to shine. You'd have to fold me double to get me in here. It'll be cozy enough with just you and the Wolfman."

The tense atmosphere went right by him. He was swinging a square satchel up from his side and opening the clasps. "Talked to old Leo again, and this time we got the problem right. First time, he asked me, how can you track down an input video signal that nobody else can see? I said, hey, I'll tell you five ways to do that, but I can't tell you which one's being used without more information."

"Three minutes," said Bey. "Or we'll have to start over with a new countdown."

"Loads of time." Aybee pulled from the satchel a thin rectangular box, a head-covering helmet, and a whole snakes-nest of wires and electrodes. "Today, the Leo-man tells me we had the problem wrong. He don't care *how* the signal gets in your head, he just wants to *see* it, know what it is drives you crazy. Different deal, right?—lot easier, because who cares if the signal came from outside, or if you made up the whole thing? The *memory* of it's tucked away somewhere in there"—he gestured at Bey's head—"so this gadget can pull it out for us."

Bey eyed the device without enthusiasm. It had a random and unfinished look. "You want me to put that thing over my head? How am I supposed to breathe?"

"Same as usual, in an' then out. There's air passages for that. Hey, loosen up. If I wanted to kill you, there's easier ways."

"Two minutes," cut in Sylvia Fernald. "Aybee, we should be in our chairs. You have to leave."

"Lots of time. Wolfman, don't you *want* to know how this works? It's dead good. See, you start thinking about what you saw—little red bogey-men, whatever. Those memories are stored away somewhere inside your head, scene-perfect. You never forget anything you experience, no one does, you just can't get at it, not in detail. So this takes your

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first-cut memory output, feeds it back to you, and asks if it's a perfect match. If not, it iterates the presentation until there *is* a match. My algorithm guarantees convergence. And all the time we're recording what we get. So at the end of a session, we've caught whatever you saw— even what you *thought* you saw, provided there's detail to it." He glared at Wolf, who was packing the flexible helmet away into its case. "Hey, what kind of ungrateful bozo are you? I put a lot of work in that. Aren't you going to try it?"

"Are you saying it may not work?"

"Sure it'll work, sure as my name's Apollo Belvedere Smith."

"Then I'll use it when we're on the way to the Farm." Bey pointed at the countdown indicator. "See that? You can look at the results of your work in real-time if you don't get out of here in the next forty seconds. The hatch secures automatically thirty seconds before the drive comes on. You coming with us?"

"No way!" Aybee was jumping for the cabin exit. "Call back and tell us what you get. Leo Manx is itchy too." He was gone, but as the other two were moving to the bunks Aybee poked his head back in. "Hey. Wolfman. Did you really rough up those three people last night, before you ran into me?"

Bey was strapped in, clutching Aybee's satchel to his chest. "Just the opposite. I didn't touch them, but one had a go at my ribs, another trod on my foot. I could show you the bruise."

"Don't bother. You see one hairy leg, you've seen 'em all. But take a look at the news. They say you attacked them, without any warning. You're getting out of here just in time."

And so was Aybee. The two passengers heard the outer hatch close, no more than two seconds before the siren announced that the drive was being engaged.

Aybee's last minute delivery proved a blessing. Bey had attempted conversation with Sylvia again once they were on the way, but she was so obviously upset about something that after a few minutes he took out the flexible helmet, attached the electrodes, and placed the set over his head.

Aybee had not bothered with such details as operating instructions. Bey sat in darkness for a while, wondering if he had omitted to switch on. He was ready to remove the helmet, but he did not want to confront Sylvia's anxious face. If the device operated as advertised, he should be concentrating on the clearest memory he had of the dancing man. It was easy to bring into mind that tiny figure, coming into view from the left of the screen. . . .

It was like form-change, but with one difference. In this case, the compulsion came from outside, not from within his own will. Bey was still conscious, but he had no control over anything. In his mind, the Dancing Man moved across the screen, paused, and moved again. *Dance, pause, adjust, reset, dance. Dance, pause, reset, dance.* On it went, again and again, each time so little different from the last that Bey could detect no change. *Dance, pause, adjust, reset.* He tried to count, while the act repeated forever, scores of times, hundreds of times, thousands of times. But he could

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not hold the number in his head. *Dance, pause, adjust, reset.* An endless, invariant procession of dancing men, capering one by one across his field of view, twisting, turning, shuffling backwards out of view. They sawed deeper and deeper into his skull, through the protective meningeal sheath, carving into the tender folds of his brain, while he was screaming silently for release.

At last it came. The cycle was broken—with stunning abruptness. Bey shuddered back to consciousness, and found himself staring up at the frightened eyes of Sylvia Fernald. The helmet was in her hands.

"I'm sorry." She reached out as though to touch his forehead, then instantly jerked back. "I felt sure you were in trouble. You lay there for so long, and then you started to groan. I was afraid you might be in pain. Were things going wrong?"

Bey put his hands up to cover his eyes. The light had become much too bright, and he had a terrible headache. "I'd say they were, but Aybee might not agree. I think he set the tolerances for convergence of his program too tight. I might have been days trying to reconstruct what I saw. Maybe I never would have got there. I could have been in that damned loop forever. Anyway, I'm all right now." He reached out and took her left hand in his, holding it tightly enough that her reflexive jerk did not free it. "I appreciate what you did, Sylvia. I could never have broken out of that on my own."

It was done on impulse, but suddenly it became an experiment. How would she react?

She allowed the contact for maybe half a second. Then she firmly pulled away and with her right hand reached across to press a switch on the side of the instrument. There was a click, and a brief buzz of sound. She waited a moment, then touched the front panel.

Bey stared at her. "You know how it works!"

"I looked at it long enough, while you were lying there. And I knew Aybee would keep it simple—he says he wants his work to be like the Cloudland Navy, designed by a genius to be run by idiots. I know which buttons to press, if that makes me an expert." She paused, her hand still before the flat front panel. "Would you like to see if you got anything? There's a playback feature, we could put it up on the display screen."

It was Bey's turn for anxiety. He wanted to know, didn't he? Surely he did, after all those months of worry. But he also felt uneasy, the same subliminal discomfort he had experienced when he learned that Mary was sending him a message from beyond the Moon.

"Well?" Sylvia Fernald was waiting, her long, slender finger poised now above a point on the panel.

The moving finger writes, and having writ, moves on, nor all thy piety nor wit, shall lure it back to cancel half a line. . . . Bey sensed himself on the brink of irreversible change, with that waiting finger as its agent. Old Omar the tentmaker might be warning him. After months of accepting the Dancing Man as a harbinger of madness, perhaps Bey was about to discover darker possibilities. Knowledge might be more dreadful than ignorance.

He was very tired. His head was aching, worse than ever. His mind had

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turned to mush. And still he sat, unable to speak, unable to nod, and watched that poised digit.

"*Well?*" Sylvia was becoming impatient. And no wonder. What was wrong with him? He had to understand. Yet he found himself drifting off again into a half-trance, turning his thoughts away from the present . . .

Bey roused himself. Bad news or not, he *had* to know.

He sat up, shivered, and nodded. "Run it."

The screen flickered, went dark, and slowly brightened. There was a splash of sharp colors, a kaleidoscope of overlaid images—red men running, dancing, leaping, sitting cross-legged, diving away, all overlaid one on another. Then the multiple exposures faded, and one picture emerged. It was as Bey remembered it, but now in clean and terrifying detail. The little man, the sharp-toothed grin, the strutting walk, the backward somersault, the jerky twitch of agile limbs. The magnetic eyes. The voice. There it was, the same sing-song voice, rising at the end of the sentence to frame a not-quite-intelligible question. Bey watched, listened, and was carried away into a dizzying resumption of the past. He reached out to play the sequence again. And again. The fourth time, Sylvia's hand was there first, pushing him away.

"No more. Not now." She had seen the expression in his eyes. Bey was far gone in his own fugue.

He sighed. "Aybee did it. He said he would. That was it, you know. Exactly."

"I know."

"I have to see it again." His hand was moving to hers, trying to push her aside. He had no strength in his arm.

"No. Later." She touched his forehead. As she suspected, it was hot and sweaty. "Bey, you have to sleep. It's been too much."

"I have to see it again. I have to *understand* it. You see, Sylvia, even now I don't understand." His voice was puzzled, a lost voice, but even as he spoke his eyes were closing. In less than thirty seconds he was sound asleep.

He was no threat now. Sylvia watched him for a few minutes. His face was the countenance of the Inner System itself; dark, older, guarded. She reached out and moved him so that he could not see the display. He sighed in his sleep, but did not move from his new position.

She reset the audio input, so that she alone would receive it, and settled down to play the image sequence, over and over. It had meant something personal and disturbing to Bey Wolf, but to her it offered different and more practical mysteries. There had been hints to grasp at even in the first viewing.

She solved the first problem after four runs through Bey's reconstructed memory sequence. After another look at the controls, she made one adjustment and watched with satisfaction at what came onto the screen.

The second problem was not so easy. It depended on a dubious recollection from more than a year ago. Sylvia finally asked for help from the data base on the space farm, seven hours travel ahead of them. They sent an image that confirmed her hunch. She settled down to wait for Bey to waken, watching his dark-complexioned face, wanting him

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to rest, but willing him to wake. She was itching to tell him.

He was asleep for almost six hours. As he woke, he at once turned and reached to turn on the display. She gripped his hand in both of hers.

"No. Bey, you don't need to."

He stared at her uncomprehendingly, still dazed with sleep.

"Watch," she said. She made the adjustment to Aybee's equipment, and started the playback.

The Red Man appeared, and still he was speaking. But now his sing-song words were clear. *"You can run, you can run, just as fast as you can, but you'll never get away from the Negentropic Man."* And then, just before he danced away, off at the right side of the screen, he spoke again: *"Don't you worry, don't you fear, the Negentropic Man is here!"*

Bey sat open-mouthed. "What did you do?"

"Time-reversal, and slowed it down." She set out to play it through again. "It was obvious. You'd have seen it, once you'd watched it right through —objectively—a few times. The movements didn't look right, too jerky, and the intonation was wrong for normal speech. Playing it backwards, that's all it took to make the message clear." She saw Bey's shake of the head. "What's wrong?"

"It's *not* clear. Not to me. I understand what he's saying, and maybe Aybee knows how the trick was worked to send me that signal. But what does it *mean?*"

"Negentropic?"

"That will do for a start. Negentropic. Negative entropy? But that's just a word." Bey stood up. He wanted to pace about, but there was not enough space in the cabin to take more than two steps each way. After a moment he sat down again and slapped at his knee in frustration. *"Negentropic.* Why should somebody say they're the Negentropic Man? Better yet, why would anybody send a message like that to *me?* I don't see how a person can have negative entropy—I'm not even sure I understand what entropy is. And I certainly have no idea who's behind it all."

"But I do."

Sylvia's quiet answer caught Bey off-balance. He stared at her. "How can you?"

"I recognized your Dancing Man. I had a suspicion when I first saw him, but I wasn't sure. While you were asleep I called ahead to tap into the Space Farm's data base. And I found I was right."

"You mean he's somebody from the Outer System, rather than the Inner System? He doesn't look anything like a Cloudlander."

"He's not. And he's not a Sunhugger, either." Sylvia was so caught up in her discovery that she forgot to be cautious. She leaned across and gripped Bey's hands excitedly in hers. "Your Dancing Man isn't one of us. He lives in the Halo. He's famous, he's a rebel, and his name is Black Ransome." ■

CONTINUED IN NEXT ISSUE

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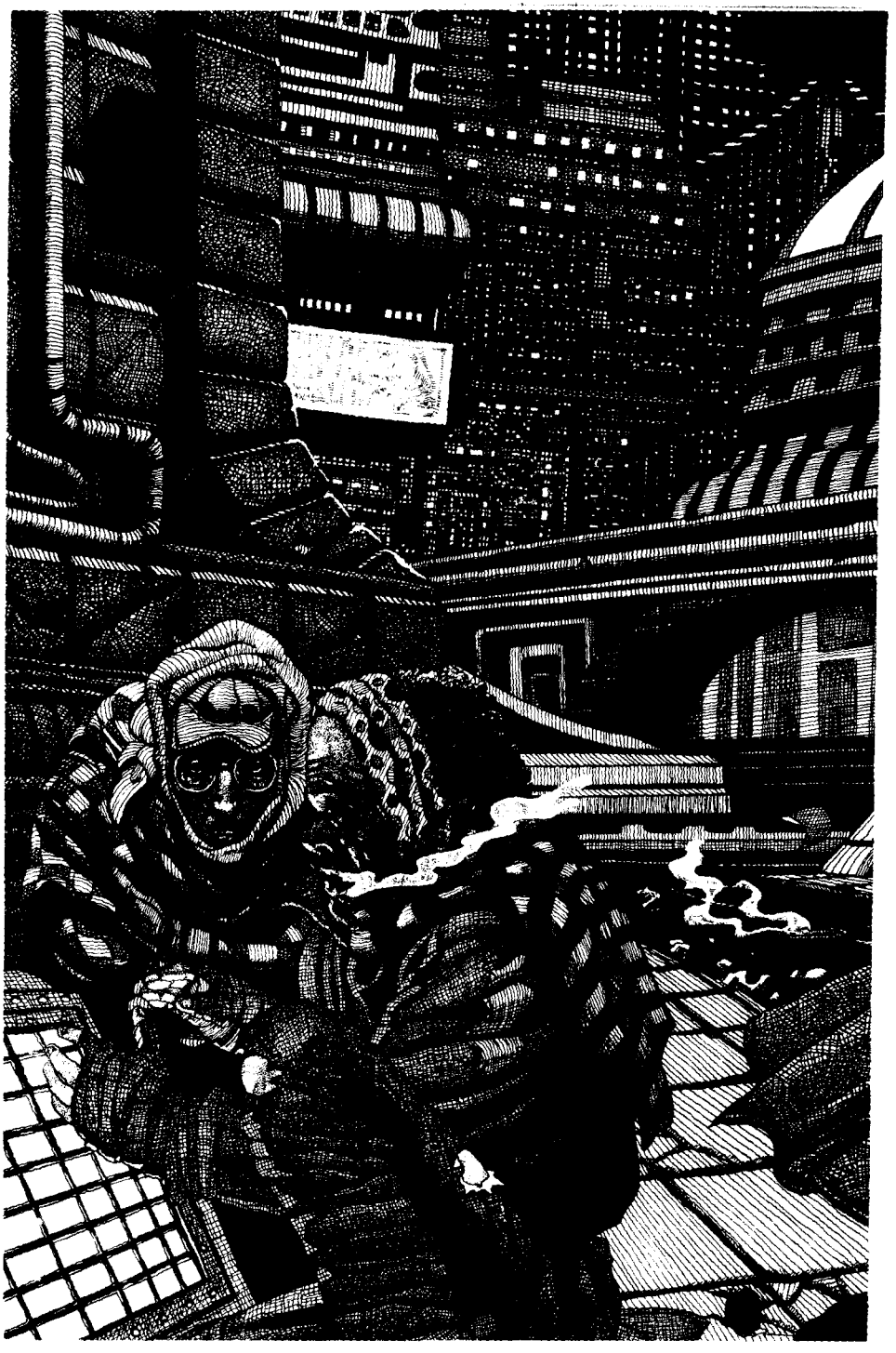

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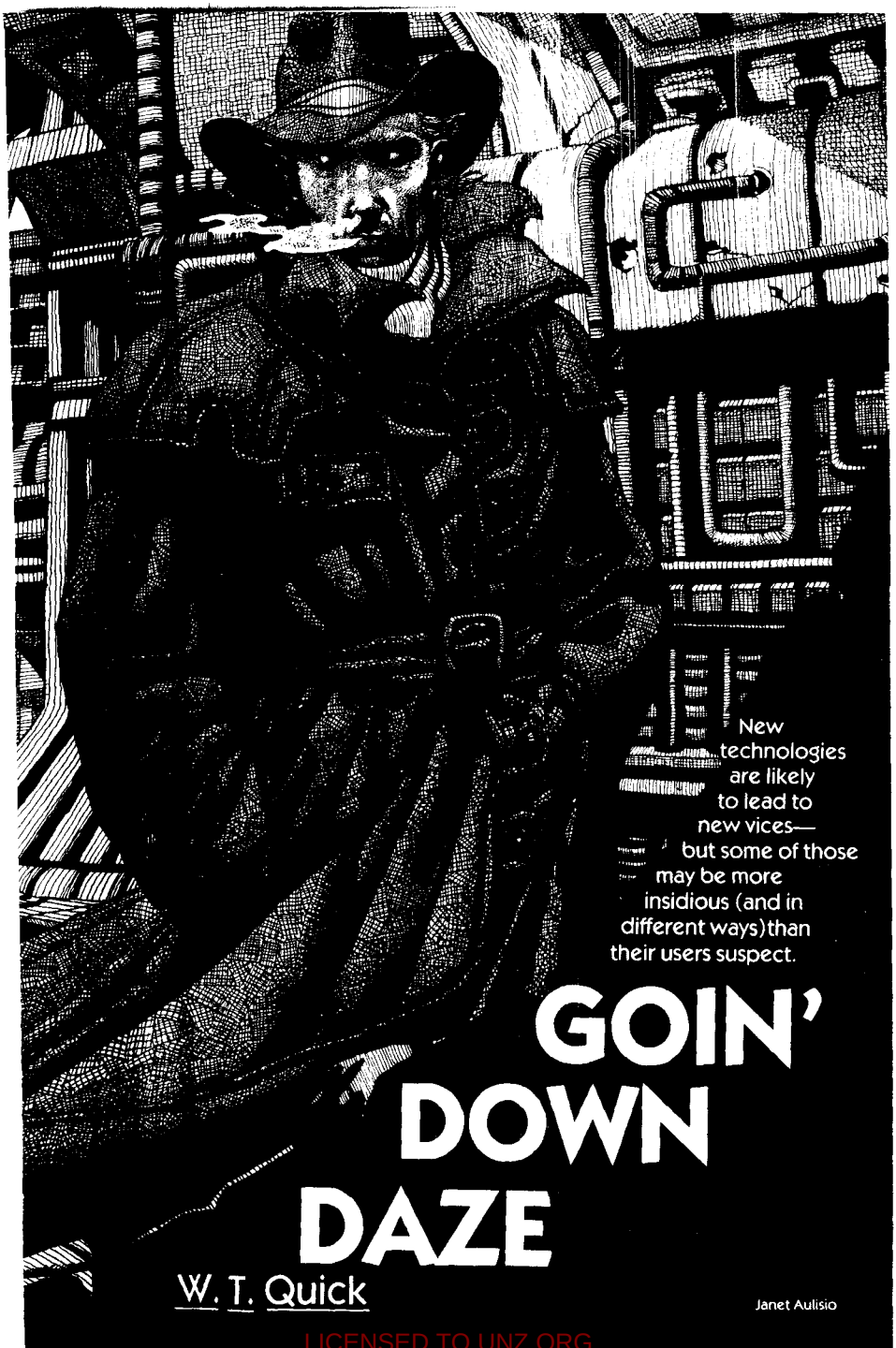

New technologies are likely to lead to new vices—but some of those may be more insidious (and in different ways) than their users suspect.

GOIN' DOWN DAZE

W. T. Quick

Janet Aulisio

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Freezing.

A big wind came whooshing down past the employee entrance of the hotel just as I stepped out and damn near pulled my hat off. You'd think they'd model those gigantic buildings better, try to control the artificial breezes they generate but, of course, they don't. I grabbed it and caught it before it ended up halfway down the block, and good thing; I'd just had a new baldy job done that morning, and naked skin would have been *chilly* that time of night.

I ducked my head and started up the block toward the monolev station. The street was pretty much empty, only a couple of creaky derelicts huddled next to a public heat grate, all bundled up in layers of rags, rubbing their hands together and breathing out clouds of silver steam. It was real quiet, the way it gets in centercity when the cold is clamping down hard, like everything is muffled. I could feel my own breath crystallizing on my eyebrows, and hoped the heat in the station was working. When it busted last winter, Chicago Metro Maintenance took a month to get it back on. Cold snaps tend to mess things up.

The two bums didn't look up as I passed, not even to beg, though I knew I looked like a good mark. At least my coat was new, and they had to have seen me come out of the hotel, which meant I had a job. And if they looked close, they could probably spot the shiny plant socket underneath my left ear, but they didn't. If they'd seen that, even the cold wouldn't have stopped them.

I know. I used to be on the Roll myself.

Janna said she'd wait for me at the apartment. I hoped she remembered, but with Janna it was hard to tell; if she dazed out on me, she could be anywhere. Anywhere she could plug in, at least.

The station was deserted, with that two A.M. hard grey feeling to it, that light that makes your eyes get gritty. Sometimes I notice it more if I'm tired, or down, but this time I just stood there waiting for my train, staring at nothing in particular and wondering if there was enough left in the frig to scramble something together for a late night snack when I got home.

"Hey . . ."

I looked around and didn't see anybody. The voice had been low, tentative, as if whoever spoke hadn't been sure they really wanted to. I looked again, more slowly this time, and made out a hunched, shadowy form against the darker shadows in the far corner of the echoing room, back against the down escalator.

"You say something?" I asked the shape.

It straightened up then, paused, moved forward a bit into the light, and I saw it was a kid. Male, early teens, and, judging by the expression on his pinched features, scared shitless.

"What's the matter? You got a problem, buddy?"

The kid scurried over to me, somehow managing to half-run forward and do a hesitant two-step at the same time. I glanced around quickly. It was a little late, and a little cold, for any of the gangs to be working a scam, but stranger things have happened. I didn't see anybody. As far as I could tell, we were alone.

"Listen, you gotta help me."

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"Sure." I reached into my coat pocket, feeling for the jingle of change. "A buck do it?"

"Not *money!*"

I stopped, took my hand out of my pocket. "Oh. Not money? Listen, kid, I don't do drugs, and even if I—"

He shook his head violently. It made his thin, straight blonde hair stand out from his skull in a rippling wave. "I got to get out of here." His voice dropped to a low hiss and he jerked his blue eyes toward the escalator. "*They'll* get me. They're waiting *upstairs*."

"They'll—?" Then I had it. I'd forgotten. I looked at him again and saw the reddish beginning of a bruise on his right cheekbone. In the light it was almost a black shadow, like makeup. I sighed.

"Gang trouble?" I tried to sound sympathetic. Since I'd bootstrapped myself up in the world, I'd tried to forget what it was like, living on the street. But now I saw, as through a dim and rusty mirror, an image; and that image stood before me.

"What happened? You hold something out? You got trouble with your council?"

It startled him. He stepped back away from me, his eyes widening. "You're connected!" he spat suddenly, and ducked his left shoulder, beginning to turn. I was quicker. I snagged his right arm before he could get traction. He knew it and turned back, snarling and clawing with his other hand.

"Hey, no. Whoa. Hold it!" Small as he was, he was a handful. I felt a quick burning line on my cheek and clopped him a fast one on his ear. It stunned him; he froze for an instant, then suddenly started shaking. I realized he was crying.

"It's okay. Listen, I'm sorry. No, listen—I don't run. I used to run, but that was a long time ago. You hear me? I don't belong to any gang, not for a *real long time*."

He quit thrashing around and stared at me. "Yeah? That true?"

"Uh huh."

He wiped the back of his sleeve across his face. He looked down at the floor. "Maybe, uh, I'm lucky then. At least you'll know what I'm talking about."

I nodded. "Probably." And wondered how long this would take, and if Janna would be pissed that I was late, and if Janna would even be there to notice I was late, and why hadn't I moved to Miami two years ago like I'd planned? At least Miami was *warm*.

"You want to tell me about it?"

He tried a shaky grin. "If you want to let go of my arm."

I did, and he did. A few minutes later the train pulled in, we climbed aboard, and did the bright worm trick down the dark tunnel.

Cause I've always been a little crazy, you see . . .

And that's what it was, of course, pure insanity. I sneaked little glances at my charge as the monolev shot up out of the ground and roared on north along the Dike. He was scrawny, with that eaten-out pallor that meant poor nutrition, fear, and not much in the way of regular shelter. And on his left hand, crudely tatooed on the flesh between his thumb and forefinger, were the cryptic dark blue marks; I recognized the Dark-

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stone Ragers tag, and another one that really made my gut do flip-flops. It was a slave mark. The kid was owned by the gang, like a piece of meat.

Slavery? In the inner city? Sure. The kid's mom—their fathers never seem to be around—had probably sold him for enough to buy a couple of grams, most likely by the time he was six or seven. The gangs don't like to buy them older than that, cause they're harder to train. It isn't legal, but the law doesn't work much on the street. Straight law, that is. The Darkstone Ragers and all the others are a law unto themselves, and if they want to buy little kids to do message work or mule drugs or other, worse things, who is going to stop them? Not the cops, for sure. The Ragers own whole station houses.

So here I was, in effect, hijacking property belonging to the Darkstone Ragers, the baddest bunch of dudes north of the Loop. I wondered what Janna would say.

No, I didn't. I knew. Suddenly I hoped she was away somewhere. I just didn't feel like explaining that feeling I'd had when I saw that kid in the mirror of my own crooked past. Somebody'd helped me once. Now who was gonna help him?

I realized I was.

Like I said. Nuts.

His name was Scully. That was all, he didn't know any other. He was suitably impressed by my condo, a large studio in one of the few unflooded buildings on the North Side, its third floor windows looking out over the Upper Dike and the Lake.

"This is it," I said. "Home." Janna wasn't there, though as usual her spoor was easy to read; a half-eaten plate of something brown left to dry on the small table, the dishwasher open and full of unscraped dishes, a pair of stretchy panty hose trailing across the arm of the hide-a-bed.

Scully looked around. "You got a roommate?"

I nodded.

He identified the panty hose for what they were. "She's kinda sloppy, huh?"

"You could say." Suddenly I was irritated with him. Who was he to criticize my taste in companions? I was taking him up, wasn't I? Which reminded me of something else.

"Listen, Scully, you want to get a couple of things straight, okay? Her name is Janna, and this is her place as well as mine. What you are is a guest. You *capish* guest?"

He shrugged. "Uh huh."

"First rule is, guests don't steal. You think about it, when you get the urge to see how much my computer'll bring. Or my CD or whatever. See, you get one chance. Something disappears mysteriously, you better be gone with it. And the only place you got to go is back to where you were."

His lower lip stuck out. "I ain't gonna steal your shit."

I grinned. "Sure you would. But I'm not a mark, kid. It happens, maybe I even find you again some day. So let's keep things simple, all right?"

He nodded one more time. I knew it was all I'd get, and let the subject drop. I went to the big wall closet, pulled out some blankets and tossed them on a spot beneath the bay windows. "You camp

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out there, okay? That be all right with you?''

Judging from the looks of him, anything involving blankets and a roof over his head was a hell of a lot better than okay. For the first time since I'd met him, he cracked a small smile.

''It's great, Jack.'' He paused. ''It's Jack, right? You didn't give me a phony name?''

I smiled in return. ''Jack's the name, Scully. Jack Berg. What it says on my comm terminal. Now get some sleep.''

I watched him make a nest on the floor. After a while I said, ''Good night, Scully,'' and turned off the light.

''G'night.''

I stared into the darkness. After a moment, ''Hey, Jack . . .''

''Yeah.''

''Thanks.''

''S'nothin. Get some sleep.''

Soon enough I heard the soft, steady intake of breath. At least he didn't seem to snore.

Nothing, heh? If only . . .

''Janna, dammit, if you'd only let me explain—''

She was tall, taller than me, slender as a whip and with a temper to match. Red hair and at the moment, red eyes. Rage, I guess. She was making soft hissing sounds as she threw wadded up balls of clothing into a duffel bag.

''It's only for a little while, until I—''

She stopped, straightened up and glared at me. In the relatively small space of my studio, the glare actually echoed. ''Listen, Berg, I don't want to hear any more about your social work project. What it boils down to is three of us in this cruddy dump, and you didn't ask me about it. You sugger, I like my fragged privacy!''

Now I was starting to sizzle a bit, about medium rare. ''Yeah? Cruddy dump is it? You seemed to think it was okay once. When you were—whadidyousay? —my *last* social work project.''

She didn't waste another glare, just turned around and resumed making small wads of larger jeans.

Well, hell. It hadn't been exactly the perfect relationship anyway. Not, at least, when Janna found out I did daze chips, in fact was, as she put it, the ''mysterious Miester Bee.'' Well, yeah to that. I sure as hell wasn't going to sign my work with my real name.

Time out for a little background here. Underneath my right ear was a cyberneural implant. A plant. Janna had one too, though I never pried as to its source. Plants cost some serious money. I'd gotten mine through the hotel, after two years of union apprpenticeship training for bartender. When I worked, chips were plugged into the plant which gave me, in effect, artificial memories. I could understand, although not speak, over a hundred languages and dialects. And I could make almost ten thousand drinks. You just blew in from Botswanna and wanted something homelike? Sure thing, bro. Mix you up a curdled goat's milk and bourbon right away. Happens they import a lot of bourbon in Botswanna, and happens that my hotel chips know all about it.

I'm one hell of a bartender without my plant, understand, but with it I'm a sugging genius.

The same principle applies in lots of different areas, and people with plants

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are definitely a giant social step above those poor suggers drawing neg income tax—what I used to call the Roll before I got off it.

"Okay," she said, "I'm out of here." She heaved the duffel bag to her shoulders. "It's been a lot of fun," she said. Maybe it had, once. It wasn't now.

"I, uh, Janna—"

Her eyes softened just a bit. "Look, Jack, don't try to explain. I didn't want you to have to make a choice. I didn't bring that scruffy kid in here and I'm really not interested in whatever deep psychological reasons you think you have for whatever it is you're doing. Anyway—" She shrugged slightly, not easy with the duffel—"if it wasn't him, it would have been something else. We both know it."

Right at that moment I knew she was right, and with the perversity that the end of every human relationship spawns, I suddenly wished that she would stay, that everything would be like it once had been. Maybe she felt it, a little, because she puckered her lips and said, "Come on, give us a kiss. For old times sake, before I go. Or start to cry."

So I did and she did, and later on, I did too. Hadn't cried in years, not since my mom died.

And still there was Scully.

The monolev slid to a halt just north of the Evanston Wall, and we waited while the local cops came aboard to check our entry passes. Mine was a long-term student pass—dog-eared from years of use. Scully sat on the seat next to me, tightly clutching his daytime temporary, and staring out the window at the sparkling vistas beyond. His nose made small, greasy marks on the window. No doubt it was the first time he'd ever been out of Chicago.

"What are they gonna do?" he asked uneasily, as the pair of Evanston heavies moved down the car toward us.

"Check our passes. That's all, nothing to worry about. You keep your mouth shut, though. Let me do the talking."

He nodded. He was a tough little street kid, probably able to do a job on one of these suburban cops all by himself, but now he was off his turf and scared. Even with me.

"Just calm down," I whispered as they came closer.

The cops reached our seat. The one closest reached out one black-gloved hand, face impassive behind his transparent face shield.

I handed over my pass. Scully pushed his forward and the cop took it too. He read both passes, then looked at me.

"You a student?"

"Uh huh. Northwestern."

"A college student, huh? And who's this with you?"

"A friend," I said.

Scully looked okay. I'd bought him some new clothes—well, new used clothes—from the local thrift store, and gotten him a haircut and made him take a shower every day. The bruises had gone down after a week or so, and the end result was halfway decent.

"Friend?"

"Yeah. He's going up to visit the campus with me. Show him around."

"He gonna be a student too?" There was a nasty little twist in the cop's voice. I didn't like it, but there wasn't anything I could do about it. Suburban

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cops didn't like us city folk much and, as far as it went, they had good reason. The Wall around Chicago wasn't built for drips and grins. Without it, there probably wouldn't *be* any suburbs any more. Still and all, they didn't have to be so damn evil about everything.

"No, sir. He's just visiting, like it says on the pass there." A little sir never hurts. It doesn't make it any harder to stick a knife in them later. Evidently Scully knew that too, because he just sat there, blinking his blue eyes and trying to look innocent.

The cop glanced one more time at our passes and then handed them back. "Right. You, uh, *boys* be careful, now. Don't go breaking any laws. This isn't Chicago anymore." Like Chicago was some kind of swamp full of monsters. Well, some truth to that, too.

"Yessir," I said.

It was about another ten minutes to our stop. I poked Scully's shoulder. "See that sign? What's it say?"

It was a big, red, octagonal mother. Anti-drug thing, stop-sign shaped, but the words on it said, "Just say no." Real tired. Nobody'd said no for thirty years, or people like the Ragers would've been long out of business.

Sculley squinched up his eyes. "Stop," he said at last. "It says stop."

I sighed. What I'd thought.

"You know why I'm dragging you up here?"

He shook his head.

"Cause you're gonna go to school."

His thin face did what I expected. "Don't look like that. You think I pay for my condo because I can't read?"

"I can *read*," he said indignantly.

I told him what the sign said. "You know what an illiterate is?"

"You tricked me."

"Cause I'm smarter than you are. And that's cause I can read. Now shut up."

It was going to be harder than I thought. And I hadn't really expected it to be easy.

Because I'd been there before, I saw it coming, maybe even before he did.

"How's the homework?" I said.

He was scrunched up next to the bay window, painfully writing letters in a notebook. Outside, a few dirty gray snowflakes drifted down. I could see a pile of windblown paper piled up against the single pollution-twisted tree in front of our building.

He looked up. "I *hate* this shit."

"Uh huh. But you're gonna keep on doing it, right?"

"They got me in a class with little kids. Snotty suggers. They treat me like I got the plague or something."

I sighed and hunkered down next to him. "Course they do. They think you're some kind of animal. It's what they're told at home. Scully, you know how Chicago got to be the way it is?"

"Always been," he said slowly.

"No, not really. This is kinda something called social economics. Listen up. See, a long time ago the government gave up on trying to help people out. Or at least started doing a lot less than it did before. But the people didn't go away, the people who needed that help. They just stayed right where they were, in the cities. So the cities tried to do what the government once did, and for a while, they held things together. Later

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on, though, more and more poor people came to the cities, because that was the only place they could get money. But the cities couldn't find money just anywhere. They had to raise it through taxes. You follow?"

He was way ahead of me. "That don't make sense. I know what taxes are. Poor people don't pay any."

"You got that right. Finally, the cities just gave up. Quit paying for schools and medical help and housing and things like that. They were broke. And when the cities fell apart. That's when things like the Evanston wall got built."

He nodded wisely. "People decided to go get what they needed, I bet."

"It was pretty bloody for a while. Finally, the cities began to recover, some. Mostly as business centers and like that. They could tax the businesses, and that helped. Which is where we are now."

He looked out the window, his eyes absently following the drifting snow as he chewed on it. "So what's that got to do with me reading?"

I clicked my tongue. "You still don't get it, do you? It's out *there*, on the other side of the wall. That's where you want to be. That's where I want—hell, where I'm gonna be, one day soon. Where the money is. And where the gangs, and the shit, and—I grabbed his hand, made him look at the slave mark—"and stuff like *this* isn't."

"Hey, you're *hurting* me."

I let go, ashamed. Whatever Scully needed, it wasn't somebody else abusing him. Not that.

"I'm sorry," I said. There was a moment of painful silence. "Look, Scully, I know how you feel. They treat you like dirt. And I won't make you go if you don't want to. Your choice, buddy. All the way. But if you stay the way you are, you're just another street kid. You've seen the difference. At least if you decide, you'll know the choice you're making. It's up to you. But then, really, in the end, it's always up to you. You understand?"

He looked down at his hand, then back out the window again. I noticed that it seemed very warm in the room, and I stood up. I went to the sofa and lay down and stared at the ceiling.

After a while Scully came over.

"Hey, Jack."

"What?"

"You want to help me with this? We got a test tomorrow."

I kept my face straight. "Sure, Scully. Sure thing."

I got home from work early, around ten o'clock. Colder than a roller's heart outside, dark as a politician's sins. The night was heavy with the promise of snow. I glanced curiously at the big armored Yugo limo parked in front of my building, but didn't look too close. There was a driver there, watching me back from behind the wheel. Probably some Japanese honcho, got himself a floozy hidden away in the building, come down for a visit.

When I opened my condo door, I saw my mistake. First thing was Scully, sitting on the sofa, his face tight and squeezed, like it had been the night I'd met him. Two bruisers strained the floorboards next to the window. Ever see a city snowman? You build them big, but after a while the soot and ash and whatever makes them gray, and

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they melt a little, and then freeze shiny again. These two guys looked like that, big and gray and melted and shiny. They stared at me with no kind of human expression on their faces.

And next to Scully, grinning a big white grin, was Billy Dee.

I'd known it had to happen. The city was the city, and nothing stayed secret forever. But there hadn't been anything I could do, so I'd tried to put it out of my mind, just sort of hope things could go on.

Stupid.

"Hi, Billy," I said. "How's biz?"

Billy Dee was the vice president of the Darkstone Ragers. Every once in a rare while we had done a little business.

"Ice*berg*," he replied, his smile going even wider and whiter, like a light suddenly turned up. Then he chuckled, like he was glad to *see* me at last, in the glare of that smile. He had a deep, honey-thick voice, sounded like a salesman. Good laugh. Word was he could laugh just like that when he killed you.

"What's up, Billy Dee?"

"Ain't had much merchandise from you lately, Iceberg. In fact, it's been mostly the other way. You been taking *my* merchandise." Again he chuckled, real deep, and smiled, real bright. Something mushy green and nasty began to crawl up my throat.

"Oh, uh, well, you mean Scully?"

And just like that the smile and chuckle snapped off. "I mean my merchandise, man. I mean my *slave*." His thick fingers snapped around Scully's arm like dock cables and Scully gasped.

"Hey, wait a minute," I said. The two monsters twitched slightly and I made very sure not to move much. "Can't we talk about this?"

Billy Dee let go. "What's to talk, man? You steal from me. How you like for me to come in here, take this ratty sofa. Or that computer over there? How you feel about that, Iceberg?"

"I wouldn't like it, Billy Dee."

"Well. So. Then we ain't got much to talk about, do we?"

The nasty green thing was headed back toward my stomach. I wondered if I could get to Billy before his goons got to me. Probably not. I would try, though. I took a breath.

Billy Dee looked at me like he could read my mind. Probably could. He grinned and let the moment hang there, and me with it. Then, "Ten grand."

"What?"

"Ten grand," he said again. "If you buy my merchandise, then it ain't stealing, is it?"

I felt like I'd stepped back from a long, high cliff. "Billy Dee, where am I gonna get cash like that?"

He stood up. The social visit was about over.

"Iceberg, I don't know. I don't know what you want with a piece of trash like this, either. I never heard you went in for that shit. So maybe it's something else. But you wanna play your games, the price is ten thousand. I can't let it get around that somebody steals from me." He moved past me to the door. Somehow, his goons were right with him. One opened the door, looked around, and stepped outside. He nodded. Billy Dee went out, then the other muscle.

The Rager veep paused. "By the way, Janna says to tell you hello. She's

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with me now. Nice little thing." He glanced at Scully. "Don't seem like a fair trade." He paused. "You know, Berg, you come to me straight, right at the beginning, the price would be two thousand. For old times sake. But you didn't. That's why it's gotta be ten. We done some good stuff together once. Which is why you ain't a grease spot right now. But this is business, not personal. Sorry."

And then he was gone.

Carefully I closed the door and locked all three locks. I went over to the window and watched until the limo pulled away. I let the curtain fall.

"You okay?" I said at last.

Scully's voice was as shaky as my knees. "Yeah. But Jeezus, Jack, what are you gonna *do?"*

I shook my head. "Beats the hell out of me."

Two nights later, on the way home from work, they jumped me. Three guys. Took their time about it and did it right. As I dragged myself up the condo stairs, I figured at least two cracked ribs. One eye already puffed shut, the other a reddened slit. But my hands were okay, and they'd been real careful about the area around my ears. No damage to the plant. That told me they were pros, and it spelled out a message. Billy Dee wasn't all that interested in ten grand.

Scully helped me strap tape around my rib cage, pulling tight when I told him to. He had a strange expression on his face. After I got myself arranged in the least painful way on the hide-a-bed, I looked at him.

"Okay," I said, "spit it out."

He sat down on the edge of the bed. His eyes shone just a bit in the dim light. "I could go back," he said.

"No, you couldn't."

He looked at my messy face. "You couldn't stop me."

"Huh uh. But that's not what I meant. It wouldn't do any good. This isn't really about you at all, actually."

"What do you mean?"

"Well, if all Billy wanted was you, he would have taken you when he was here. Or offered to let me return you. But he didn't. See, he's after something else."

"I don't understand."

"He's after me, Scully."

It took him a moment. "If he wanted to wipe you, nothing to stop him. So, uh." Then he remembered. "What kind of business you used to do with him, Jack?"

"Now you got it," I said. "You know what daze is?"

He was a street kid. "Course I do. Dream chips. People like you, with plants, pay a lot for them. Plug in, take off, go high. Rich people's shit." He rummaged for another moment, just to prove how much he knew. "Best kind's called Purple Bees. Cause of the color. Not much around anymore, though."

I nodded slowly. "Yeah. I haven't made any for quite awhile now."

"Oh." That's all he said. Just, "Oh." Then he said, "Maybe I could kill him."

Suddenly I felt so sad, for all the things I'd done, for all the things I would do. And for the whole world, maybe. I thought about the tidy little stash I had, carefully hoarded from days I thought I was long finished with. Only

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a few more months to my degree. I could move out, go to Evanston. They'd take me on a temporary, and when I graduated make it permanent. I could do that.

But Scully couldn't, and the stash wasn't enough for two.

Scully mistook my silence. His voice lowered, went slower, but stayed steady and determined. "He wouldn't be scared of me. Maybe I could get close enough. I got a knife."

By then maybe we were both leaking a little. I don't know. Could have been.

"No," I said. "There's another way." I wiped something out of my eye. "That's the trouble. There's always another way to skin the same damned old cat."

He sent Janna to pick up the goods. Rub my nose in it, I guess. She came into the room and looked around. Her gaze slid over Scully like he was used toilet paper.

"Same old Iceberg," she said. "You got the stuff?"

I pointed at a neatly wrapped package on the table. "You bring the money?"

She walked over to the table and picked up the package. Snapped it open, sliced into one of the tiny bubble packets and slid out a shining purple chip. Slipped it into her plant with a single practiced movement.

I watched as her features went loose and dreamy. After a time I got up, went over and pulled the chip out myself. It was the best stuff I ever did, and I'd always done it better than anybody else. She would have stood there all day, dazing away.

I replaced the chip and rewrapped the package. "You got the money?" I said again.

Wordlessly she reached into the pocket of her short fur and handed me a small bag. "Gold," she said. "Like you wanted."

"Thanks."

She seemed distant to me now. Maybe she seemed distant to herself. Slowly, she turned toward the door. Fine. We were both headed in the same direction, and it was away from each other.

As she touched the knob she stopped. "You know, Jack, you're a real asshole."

"How's that?"

"You're still the best. Nobody ever brewed daze like that stuff I just did. You could've been rich by now. But instead—" She looked around the condo, looked at Scully, looked at me. She didn't have to define "instead."

"I would have to deal with Billy Dee, though."

"That's your explanation? That's your *sugging* reason, for chrissake? You're dealing with him *now*. Is that what you tell the kid? All that high and mighty stuff about bettering yourself, making good. *Changing* things?"

I just stared at her. I didn't want her to know how much of what she said scared me. After a while she turned back to the door and opened it.

"Nothing changes, Jack. Not in the city. Never in this world."

I watched the door shut. Something cold blew up my spine.

"Is she right?" Scully said. "I mean, you wanted to get away from the Ragers, from Billy Dee. You told me. Why you worked so hard, taught yourself things, went and learned things. But

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you're right back in it now. Billy will never let you go."

That door was so interesting. I imagined I could see her beyond it, going down the stairs, entering the limo, returning to Billy Dee with her package of bright purple dreams.

I looked up at Scully. "Funny thing about dreams," I said.

He looked at me like I was crazy.

"See, if you work hard, and teach yourself things, and go out and learn things, you can make dreams do what you want them to. For instance, you can make dreams that are addictive. And you can make your addictive dreams do terrible things to a mind. Say, to a mind that thinks slavery is a good thing. You could even make dreams that would wipe out somebody's name from your mind after a while. Probably two names, if you knew enough."

I shook my head. "But no, I guess I can't give you any *real* reason to work and study and learn and stuff like that."

Scully wandered over to the window and stared out. North was Evanston. "Jack?"

"What?"

"You gonna help me with my homework? I still got a lot to learn."

I picked up the bag full of small gold bricks, my profit on the batch of daze over and above Scully's price.

"Not now, kid," I said. "We got to get busy."

"Yeah? Doing what?"

"Packing. For the trip."

"What trip?"

"The Wall, Scully. The trip over the Wall." I thought about how Janna's words had scared me. Then I thought about the way he'd been ready to go back, even kill to help me out. And I realized I'd never truly believed the city could lose, that simple decency could win out. That things could change. As Janna said, not in this world.

I grinned. "Maybe there's still a few things for me to learn, too." ■

● If the fool would persist in his folly he would become wise.

William Blake, *The Marriage of Heaven and Hell*
Submitted by Dave Humm

● You can't depend on your judgment when your imagination is out of focus.

Mark Twain

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Jay Kay Klein's biolog

With the astounding increase of science fiction writers, a first-ever appearance in the October, 1979 *Analog* probably marks William Thomas Quick as one of the older writers. Not so strangely his first story, "Instructions Enclosed" was about the difficulties of arranging for proper programming of a "genius" computer, since Bill had been a computer programmer for RCA, back when it was an American company. The computer manufacturer in the story even resembled an American big-business corporation.

Bill still considers himself a beginning writer in a field that he thinks is the only one where age forty is considered young. Well, you do have to be pretty flexible-minded not just to write SF, but also to keep up with accelerating social and scientific changes. Consider Bill's first story, where what might have been RCA, with its American business culture ethos, would today be incorporating the changes of its French owner. Perhaps it would no longer be so unthinkable that a corporate CEO would tolerate a computer that wrote poetry. And, anyone can drop into the corner computer store and pick up once corporate clean-room hardware.

"The tech curve is about to go straight up," Bill says. He notes the value of SF is that it reflects what is happening in an area that is becoming the single most important factor in everyone's life. Science and its associated technology is rapidly changing everyday life. Bill feels that anyone, and anyone's culture, that fails to realize this is not just doomed to live in the past, but just plain doomed.

Bill appreciates the fact that *Analog* will consider anything, any idea, as long as it is worked out well. Not yet a full-time writer, he has earned eating money in the food and drink area as busboy, waiter, bartender, and restaurant manager and owner. Living in San Francisco, he part-times as a bartender in a small restaurant where viands are not just cooked, they are mesquite-grilled.

He started out in Muncie, IN, and has lived for varying periods of time in Denver and Chicago. A year at Indiana University as an English major convinced him that he'd already mastered the art of learning on his own. At a small Muncie private boarding academy, The Hill School, they stressed the idea of a liberal education.

At the academy, by a wonderful coincidence, Theodore R. Cogswell's wife was his social studies teacher. Ted himself has been gone a year now, after having created some classic SF here, such as "The Specter General," and the Probability Zero spoof, "The Great Population Implosion." Back when Bill was an impressionable fourteen-year-old, Ted got him started on writing SF. He plans to continue, too. A first novel, *Dreams of Flesh and Sand* is due out this spring from New American Library. This is to be the first of a "technofantasy" trilogy. Here, elements of classic fantasy are melded with hard technological and social developments. This is the sort of thing *Analog*'s engineering readership once loved in a long-gone companion magazine, *Unknown Worlds*. Bill thinks any division between "hard" and "literary" SF is purely a convention. If there's anything Bill is, it's unconventional. ■

W. T. Quick

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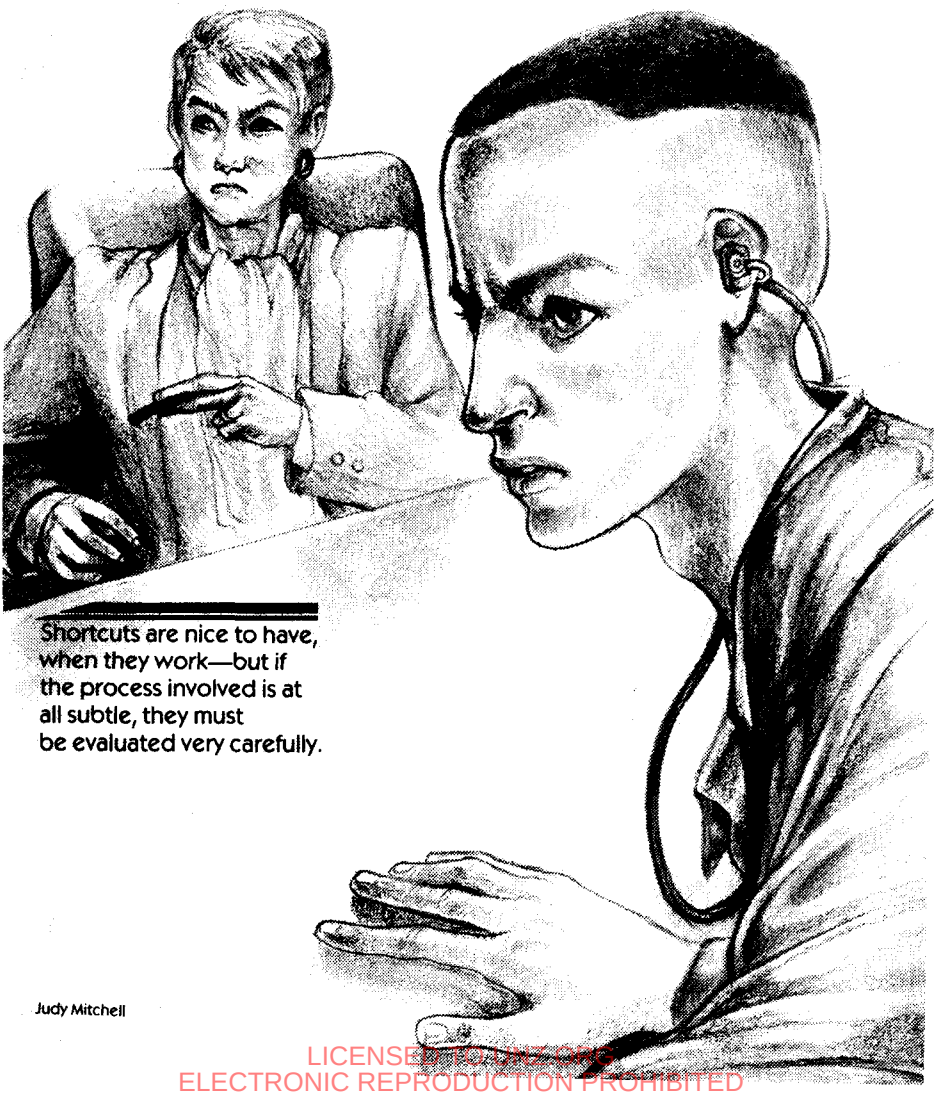
THE READING LESSON

Stephen L. Burns



Shortcuts are nice to have, when they work—but if the process involved is at all subtle, they must be evaluated very carefully.

Judy Mitchell

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Ronda's dark, heart-shaped face wore a look of intense concentration as she read, but fleeting smiles, frowns, and other expressions flitted momentarily across as the images and phrases hit home. Her slow progress plotted with her finger, she continued to real aloud in a husky voice.

" 'An age-ed stranger entered and moved with slow and noise-less step up the main ays—yis—' "

"*Aisle,*" Walt prompted gently.

She looked up from the book, her smooth brown brow furrowing. "That's a foreign word, right?"

Walt's black-bearded mouth curved into a smile. "What makes you think so?"

A lively intelligence had emerged and taken on a brighter polish as the twenty-five-year-old woman had mastered the manifold intricacies of the printed word. It was a lovely miracle that her depressingly bad early education, the narcotizing effects of TV, the prevailing attitudes of her neighborhood, and the all-around smothering numbness of life on the Dole had not destroyed her wit and iniative as it had in so many others. She had decided to learn to read at twenty-two, been assigned to Walt, and had steadily blossomed in the three years since. She had the tendency to ask the damnedest questions and make the oddest observations, which made her one of his favorite clients.

"Well," she said, "We mostly make words look like they sound. But a-i--" She consulted the book. "--s-l-e? That's so damn dumb it's just gotta be French! Right?" Her face wore a look of prim distaste.

That got Walt laughing, his stick-thin body twitching like a marionette operated by a spastic hand. She had taken to Mark Twain like a duck to water, and seemed to have soaked up his crusty anti-French sentiments in the process. He folded one long arm around her shoulders and gave her a hug.

"Believe it or not, you're right. We did take the word aisle from the French."

The tightly-braided cords of her hair danced as she nodded, her worst suspicions confirmed. "Should'a let 'em *keep* it, too."

Walt tapped the book with his finger. "Twain thought it a good enough word to use, even if it was French."

She thought that over. "Okay, aisle. 'Up the main aisle, his eyes fixed on the min-is-ter, his long body clo—*clothed* in—' "

Walt settled back, crossing his arms and letting the familiar, beloved words of Twain's *The War Prayer* roll over him. Soon she would read the prayer itself, and the phrases would catch her up: "Oh Lord our God, help us tear their soldiers to bloody shreds with our shells; help us cover their smiling fields with the pale forms of their patriot dead." Only words, but forged into thunder and music as only old Mark could do it.

He helped her over the frothy cataract of the stranger's hair, helped her plumb the hollow, spooky syllables of ghastliness. The Twain was an end-of-lesson treat. In only a few more months she would read well enough to begin cramming. Then she would have a chance to put the Dole behind her once and for all. He took a special pride in her wanting to become a grade school teacher. She was bright enough, and more im-

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portantly harbored a fiery passion to see that kids got a better chance to escape the Dole than she had been given.

Just as they were reaching the point where the stranger informs the congregation that their prayer is actually two prayers, the door to his study opened.

Ronda stopped mid-word; both of them looked up, startled. He was surprised to see his wife, Anne, filling the doorway. Her coming home early was only slightly more probable than her tearing off all her clothes and running naked down the highway. Very long odds.

"Am I interrupting?" She spoke hesitantly, her big hand still on the doorknob, poised to turn and leave.

Ronda spoke up before Walt had a chance to open his mouth.

"No, we's—*we're* just finishing up, uh, Anne."

He glanced at his pupil out of the corner of his eye. Not that long ago she would have hidden her face and gone all tongue-tied in Anne's presence. It was just one more reminder of how much the lovely young woman had changed since learning to read. He noted the knowing near-smirk she wore, trying to figure out what it meant.

Then he had it. She thought that Anne had snuck home for some sort of romantic rendezvous! The thought was so preposterous that he had a hard time keeping a straight face. Imagine orderly, everything—including sex—in its place Anne doing anything so spontaneous!

But then again, why had she come home? He could set his watch by her 8 A.M. to 7 P.M. schedule, and if she was home in the daytime then it was Sunday. Something was afoot.

"I suppose we are done for the day," he said, closing the book, "We'll save the rest of this for next time. Are you still working on *Wind In The Willows?*"

Ronda's milk chocolate complexion darkened to bittersweet and she ducked her head. "I know it's just a kid's book—"

Anne spoke up. "I'm still in love with Mr. Toad. He—" A regal nod in Walt's direction. "—was my second choice."

Ronda giggled. "I got an uncle just like Toad. He's never 'mounted to much, always in trouble, but he's still my favorite uncle of all." She stood up and patted Walt on the shoulder. "This guy's no Toad, but you oughta keep him anyway." Gathering up her coat, purse and bookbag, she circled the table and headed for the door.

Anne stood aside. "I believe I shall," she assured the younger woman as she drew near. "Nice seeing you again."

"Same here." Ronda looked back at Walt, gave him a theatrical wink, then hurried out. But not fast enough to keep them from hearing a new fit of giggling. The sound ended at a closing door.

Anne sauntered in then settled her six-foot-plus rawboned frame on the corner of the reading table. Her tanned, slightly horsey face wore a secret smile. But she said nothing, only smoothing the lapels of her severely-cut tweed jacked and studiously avoiding Walt's gaze. Though she would have bridled at the word, Walt knew she was being coy.

He eased back in his chair, curious and amused. "Ronda thinks you popped up to drag me off to bed." He ratted up

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his already unkempt black hair with his fingers. "I do believe she thinks I'm your love-slave."

That caught her off-guard; her mind did not work along those lines. The fine webwork of lines at the corners of her cool blue eyes curved as she gave him a rueful smile.

"And you aren't?" She looked his tall, painfully thin body up and down, then shrugged. "The idea is tempting, but I'm afraid that even the lust-enticing bounty of my glorious femininity would barely pass for second prize compared to what I have in mind for you. Hard as that might be to believe."

Walt let the ironic self-depreciation pass. It was habitual, though more joking than when he had first met her. For Anne, body and mind were separate and unequal. Nature had spared no effort when putting her brain together; she was nothing less than brilliant. At forty, she was one of the acknowledged masters in her field.

But it had also dealt her the tall, stringy body of a cowboy subjected to a half-successful gendbend. Big hands and feet, her body all lean, hard-scrabble plains of stringy muscle, wide as the Oklahoma flatlands she had grown up on, breasts that were an afterthought, saddle-hard curves built up over sharp knobs and ridgepoles of heavy bone. Only at rare times did she wear her body happily.

Even after five years of marriage she still only half-believed that he found her sexy or beautiful. But he did, then and always.

He was not exactly a hunk himself. He had once described himself as looking like a refugee from a Russian Gulag; bearded, big-eyed and beaky, thin as borscht for ten made from a single beet.

He leaned forward, pulling his legs up under him. "Then first prize must be a double-feature matinee." He leered, licking his lips. "I'm sure I can find something better to eat than popcorn."

That got a laugh out of her. Her face coloring, she shook her head in wonder. A stray beam of prarie sun caught her close-cut hair, transmuting the dull blond into gold. "You could romance a girl off her feet, but . . ." She cocked her head and spoke with a calculated offhandedness. "I want you to come back to Mindset with me."

Walt blinked in surprise. "You're putting me on." *Curiouser and curiouser.* Their lives fitted together in a fairly strange way, leading two lives but sharing only one between them. Both kept their work in tightly sealed compartments, each for their own reasons. In the hours they spent together he almost never talked about his writing, and she averaged about ten words a year about MindSet. She had shown a marked disinterest in his horror novels, and was almost pathologically secretive about her work. He had known her for five and a half years now, yet this would be the first time he had ever been inside the place.

He accepted her secrecy. But sometimes he felt like Bluebeard's wife.

Anne answered by sliding off the table. "Come on, I want you to come and see one of your fondest wishes come true." He could see that she was nearly bursting with a secret she wanted to share, and it had to be something big to make her finally decide to let him into that other part of her life. He had

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planned to spend the rest of the day working on chapter four of his new novel, but it could wait.

He stood up, unfolding like a carpenter's rule. "I know," he said as he followed her toward the door. "You've come up with a way to cram people into taking axes to their boob-tubes!"

She looked back, clearly puzzled. "Why would I want to do that?"

Anne drove her car on manual, the high-performance hydrogen turbine whining loud enough to be heard inside the Dojitsu's sumptuous interior. The grey asphalt ribbon unwound under them at upwards of 200kph. At that speed the irrigated flatlands of Oklahoma's Woodward County scrolled by in a corn-green, wheat-yellow blur. The carcomp was silent. They had the road to themselves.

Even now Walt had to contrast his new home against the dying dinosaur of his native Pittsburgh, with its choked roads, unending miles of drab housing projects and abandoned factories, its restless, anthill-dense population. He had left the city's grim claustrophobia behind and come to this quiet place of wide blue skies and endless horizons to research a novel and write in solitude.

After just a week he had been thinking about making the move permanent. Then, during his first disastrous experiment with horseback riding, his mind had been made up for him. Not long after lying about his riding abilities he had found himself desperately clinging to a bucking sorrel mare, the normally placid creature probably enraged by his ineptitude. Only the knee hung over the saddlehorn and his deathgrip on her mane was keeping him on.

He was convinced he was about to die. But suddenly Anne had galloped up out of the sun like some Horse-Goddess from an old Howard fantasy, surely wheeling a huge, snorting white stallion alongside, plucking him off his rearing mount and almost effortlessly pulling him onto her horse's back behind her. That was the first time he had seen her, and in that moment he had seen that she was beautiful.

After an odd, perplexing, six-month courtship they had tied the knot and began their equally odd, perplexing marriage.

He still had his solitude. He also had rules and taboos which had to be obeyed to keep their curious, slightly lopsided relationship intact. But Anne was unique, and keeping her would have been worth twice the effort, thrice the patience.

She flipped open the wood and leather console, taking out one of her slim cigars. Walt waited patiently as she lit it. She only smoked when she was nervous, and her taking him to MindSet was something of a landmark intimacy.

She let out a streamer of the mildly narcotic smoke. "All right. I know I don't talk much about my work."

"You make the sphinx look positively gabby, my love." It was only in the week before they were married that she had admitted that she was not just the top researcher at MindSet, but owned it outright. That supplied a couple more pieces in the puzzle. It explained her obvious wealth, for MindSet was at the cutting edge of research into new Patternings, the information imprinting programs used in the mind-

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computer learning process popularly referred to as cramming.

It also went a long way toward explaining her almost pathological secretiveness about her work. There was a very real danger of industrionage. He had grown used to having the house swept for listening devices twice a week, even though she never talked about her projects. Those sweeps had paid off often enough to keep him from thinking her simply paranoid. Nothing was ever simple with her.

But more than that, he was pretty well convinced that she kept her work so carefully separated from her life with him because she was trying to create a life for herself outside the lab walls, something she had despaired of ever enjoying before she met him.

She looked down her nose at him. "I have talked about my work before. But you always fall asleep."

Trying to keep it light, he said, "Techspeak makes me drowsy."

She kept one big hand on the padded leather yoke and took a long pull on her cigar. "Patterning is too complex a process to be discussed any other way. But no techspeak this time, I promise. Remember the Langram?"

"Sure. That made you very rich. Excuse me, even richer." It was still bringing in royalties hand over fist. One month's check had purchased the Japanese custom racing machine they were riding in and covered the cost of their trip to Sapporo to pick it out. The car had been her idea, the trip his. Her lab had been the first to break the language barrier, coming up with a patterning paradigm which would imprint an entire language, both written and spoken, in a matter of two or three weeks.

The carcomp blipped. They were overtaking another car, but the other lane was clear. The carcomp warned the other driver's onboard as Anne sent the car surging ahead even faster. Seconds later she whipped the silver Dojitsu past the other vehicle like a guided missile. He had grown so used to her driving that he barely cringed.

As usual, she ignored the subject of money. "Do you remember asking me why it would only work on people over a certain age? And what I told you?"

He had caught her in a rare expansive moment after Health, Education and Welfare's Pattern Testing Group had approved the Langram. It was closest to specifics she'd ever come—until now.

"I do. You said that Patterning was something like making a map overlay, and that it could work only if the person already had an adequately developed language map for the engram patterns to be congruent with. Right?"

She patted his leg. "Very good. Now what happens if someone—let's call him Joe—crams Russian. Our Joe speaks well and has an above average vocabulary, but he is illiterate. He can't read any better than Ronda could when you first started with her. What has he gained afterward? Can he read Russian?"

So far she was sticking to popular knowledge. "No. Not any better than he can read English."

"Right again. But the kicker is that afterwards he can speak Russian only as well as he can read English. Do you know why?"

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Even though he was married to one of the leading lights in the field, Walt's knowledge of cramming was hazy at best. He had dropped out of college before it came into general use and never crammed in later life, afraid that it might somehow blunt his creativity. He had his own paranoias to match his wife's.

"Well," he said, "I think I read somewhere that a verbal map alone isn't enough to support patterning, and is too indefinite to be mapped in the first place. It has to be buttressed by the, uh, word-map made by reading skills."

That earned him an approving nod. "That's a crude but usable way of looking at it. Patterning is the high-speed implantation of information directly fed along the cognitive concept paths formed by the ability to read, tapping the brain's truly astounding information-processing and storage capabilities. I could explain it better if I got technical, but it isn't time for your nap yet. Without that reading map we can't chart, and random engrams are unviable."

The carcomp's destination beeper chirped. The Mindset complex's front gate was only a couple kilometers ahead. Walt had to wonder what it would be like inside, and why Anne had chosen this particular moment to initiate him into the mysteries of her work.

She gave him one final clue. "Right after we perfected the Langram, HEW brought us a proposal suggesting we work on the toughest project yet."

The crashweb tightened around Walt's body as Anne began one of her typical high-speed braking maneuvers. The HEW bit was news to him. But then again so were most of the details of her work.

He had never pressed her about it. There was nothing ordinary about her, and so the usual rules did not apply. That was part of her allure. She was a puzzle, rare and strange, too secretive and complex to ever be boring.

Besides, she never jogged his elbow when he was writing. In fact, getting her to read one of his completed works was like pulling teeth. He had all but given up on that front. She was, much to his regret, absolutely fiction-blind.

Then it all clicked together like one of his serpentine plots. Langram. HEW. Her sudden decision to give him a peek into this part of her life. 'One of your fondest wishes come true.' Could she be hinting that—

He said it out loud. "You've come up with a literacy pattern. A way to cram reading."

The car slid to a smoking tire stop before the front gate. Inside the high electrified fence a white, three-story jumble of planes and angles gleamed in the late summer sun. The guard sauntered out of his gate-house as the overhead scanner hummed above them, checking the vehicle for explosives and unauthorized electronics. The scanpad glowed green, and the heavy gate began rumbling out of the way. The guard gave Anne a cheery salute.

She waved back, then turned to face him, her plain features lit with a maniacal grin. "Well," she said, "Isn't that better than a nooner?"

Walt could only shake his head. "It's close, love. Very close."

He had been doing Literacy Volun-

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teer work for almost fifteen years. Pride and satisfaction had been his payment for those pupils who had stuck with it, overcoming the handicaps of a bad early education, turning their backs on the seductive path of the Dole, committing the time and effort it took to learn to read. Once that hurdle was passed new lives awaited them.

Some had patterned—crammed—as teachers, others as techs, nurses, terminalists; occupations as varied as the students themselves. A handful had even gone up to the Islands. Not as part of the minuscule quota of low-paid, low-status Labbies, but as well-educated full members of the new societies being built far above the cradle Earth. People with futures. People making the future.

But there were times when he felt that he was just chipping away at an Everest-sized mountain of darkness heaving up out of the earth a thousand times faster than he could swing his little hammer. For every chip he took off, a whole new crag thrust up.

Cramming—one slang term for the patterning process earned by its earliest incarnations—brought about a revolution in higher education. It allowed massive amounts of information to be fed directly into a student's mind at incredible speed. That freed teachers to spend their time helping the student understand and use that information —Actualize it—and teach skills, methods and meanings. No longer was most of a teacher's time spent drilling an endless stream of facts into a succession of skulls which at times seemed hard as concrete and quite solid all the way through.

Cramming most often began at around the ninth grade level. Children were tested for engram viability every two months from the sixth grade on, and once they passed that critical point they could begin spending their school time learning, not just memorizing.

But, as with every advance, there was a downside. The chances of a child attending public school actually receiving a good enough education to reach patternability were decreasing yearly. That problem was most acute in the urban areas, but generally endemic. Passing into the new millennium had not changed that age old problem.

The sixth and seventh generation computers had made cramming possible. They had also helped design and control cheap fusion power systems and provided a method of rational resource management. The Islands had catalyzed an economic boom. The line between rich and poor blurred. Life on the Dole would have passed for a comfortable middle-class existence only fifty years before.

Walt had the feeling that people in America—and those who imitated her—were splintering into two new classes: the Literate and the Lost.

The Literate could cram. The full spectrum of skills and vocations lay open to them. A whole new specialty or career could be tacked on in a matter of weeks to months. They were the makers, keepers and builders, the teachers and administrators, the ones laboring to try to reform the earth into a rationally run place. They were the ones remaking space into man's home, draping it with the glittering necklaces of the Islands,

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turning the Moon into a place as busy as a hive of bees on a summer's day.

Then there were the Lost. If they did not learn the critical amount needed to cram, then chances were there was no place for them other than the Dole. Cramming was now the standard method of job training. There were hundreds —perhaps thousands—of people for every unskilled Labbie job. So most were simply surplus, shunted into a dead-end so well-padded that the majority didn't even care.

Of that residual minority a few sought to pull themselves by sheer determination. Ronda was one of those, refusing to spend her life in tranked, tubed meaninglessness.

The rest expressed their frustration and alienation with the rage of trapped animals or chemical nihilism in growing numbers.

Anne wasted no time showing him labs, offices or rooms full of humming, high-tech goodies. She took him straight to a wide high-ceilinged room on the second floor which had been set up like a secondary school classroom. Once inside, she swung her hand to take in the twenty-odd men, women and teenagers seated in comfortable chairs before an array of pastel terminals.

"We call them the class of '31. HEW's Pattern Testing Group will be here tomorrow to check them out. I was going to wait until after the testing was completed to tell you about them. But I knew what this would mean to you and just couldn't wait any longer."

He risked giving her a quick peck on the cheek even though public displays of affection made her uneasy. "I'm glad you did. You're saying all these folks have learned to read by cramming?"

"Every single one. When HEW sent them to us two weeks ago, not a damn one of them could read above the first grade level."

They all looked so intent that Walt figured they must be taking some sort of test. The only sound in the room was the slow clack of keys under uncertain fingers. "What level do they read at now?"

Anne looked smug. "College entrance."

That snapped him around to face her. "In *two weeks?*"

"The program's a beaut. Comprehension and retention test higher than average, and their reading speed is increasing as they actualize the pattern. And get this, it's a low-hour regimen! A two-hour cramming session every other day, actualizing in between, the full course done in five sessions on the machine!"

He let out a low whistle. It was like a dream come true, a way to level the black mountain once and for all. This had to be as big a breakthrough as patterning itself had been when Dr. Leroy Sutter and his team had used crude memory-enhancement drugs and fifth generation computer equipment to 'plant the first engrams back in the mid-nineties.

"Do you think they'll approve it?"

Anne laughed. "Approve it? I bet it will be mandatory within a year!"

Her answer wiped the smile off his face. "Mandatory?" A *mandatory* patterning?

His wife was oblivious to his question, to say nothing of his change in

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mood. Her blue eyes fairly glowed as she looked to the future. "Once the new pattern is distributed to all schools and given at, say, age ten—that seeming to be the cutoff according to our projections—we'll have made a start. The next step is to make it usable at an earlier age, maybe working out a set of increasingly complex patterns which make the process self-additive. Now we can start working out patterns for the other elementary subjects." She paused for breath and Walt took the opportunity to break in.

"That sounds good, but—"

He never got a chance to express his doubts, and probably have them laid to rest. Anne's ID badge chirped. "Dr. Howard?" The small voice came out of the flat plastic plate like a ventriloquist's trick.

She touched her badge. "Here, Livvy."

"Call for you. Dr. Phat from Pattern Testing."

"I'll take it in my office in just a minute. Please have him hold."

She gave Walt a rueful smile. "Duty calls. I have to talk to Randy about tomorrow's tests." She gestured toward the quiet people working at their terminals. "Talk to some of them, check out their skills. I'll be back in twenty minutes or so."

Then she bustled off, not even giving Walt a chance to say a single word. He watched her leave, feeling slightly abandoned.

He had watched the beginning of a transformation as she passed through the front gate. She had begun sitting straighter and shedding her diffident air. By the time they collected their badges at the front desk her manner had become businesslike and confident. All along their trip to this room she had given orders and advice to a whole succession of people who had popped up and waylaid her, her manner crisp and decisive, friendly but authoritative. The aloof, insecure, mildly anti-social woman he had married hardly seemed to exist inside these walls. He had to wonder if he should blame himself that she was still so reserved and uncertain outside this place, or be proud that he got her to come out at all.

He dragged his thin fingers through his tangled beard. He would give the matter the slow, careful thought it deserved later on. The thing to do right now was talk to a couple of these people.

The terminal nearest him was occupied by a whippet-lean hispanic boy of perhaps sixteen, his coal black, side-cropped hair revealing ears filigreed with a Sony induction radio. His loose-fitting red satin shirt was open to the waist, baring his hairless mahogany chest, its tails stuffed into tight black cultured-leather pants. He looked up as Walt approached, his doe eyed, handsome face carefully neutral.

Walt offered his hand in the side-brush Rodrigo, a former student who had gone on to become a law clerk, had taught him.

"Walt. *Bue'diaz'igo.*"

The boy gave him the ritual brush and clasp. "Tomas."

He jerked his shaggy head toward the door. "The Mondona Dr. Howard is my wife. I teach reading. She tells me you've gotten pretty good at it."

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Tomas gave a fluid shrug of his shoulders. "I guess."

Walt peered at the screen, the words glowing green against the grey background. "What're you reading? Anything good?" He scanned the lines of print by habit, no more able to keep himself from reading than a compulsive gambler could pass a crap-game by.

Another shrug. It was a pop science article on the new space elevator going up over Greneda. A bit on the dry side, a weekly newsfax sort of thing. "Pretty dull, huh?"

That got the merest smile out of Tomas. "*Muy* dull. Brickscreen."

Walt filed that little bit of slang away for later use. "Mind if I find out what this thing can access? There has to be better reading in there somewhere."

Tomas pushed his chair back. "She's all yours, man."

The terminal was running a standard Library access program. He exited, picked the name of a book out of the back of his head and called it up. A fastscan took him to a good passage. He straightened up. "Can you read this? Aloud, I mean?"

Tomas eased forward. " 'The Modern Man, or Nervous Wreck, is the highest of all animals because anyone can see that he is. There are about two billion Modern Men, or too many. The Modern Man's highly developed brain has made him what he is and you know what he is. The development of his brain is caused by his upright or bipedal position, as in the Penguin, the Dinosaur and other extinct Reptiles. Man has been called the Talking Animal because he talks more than any other three animals chosen at random. He has—' " The boy read on through to the end of Will Cuppy's short essay on Modern Man, Walt watching and listening closely.

The strange thing was, he might as well have been reading a set of actuarial tables. He didn't crack a smile, not even at Cuppy's listing of Modern Man's pursuits being, in order, 'murder, robbery, kidnapping, body-snatching, barratry, nepotism, arson and mayhem.*

He couldn't help remembering Rodrigo grinning and saying, "Man, he musta went to my school. That's the neighborhood, that's the *life!*"

"Well?" He must have some sort of reaction.

Tomas shrugged. "We call barratry *sueyo*."

Walt knew the term. Sueyo as in *sue yo' ass*.

Okay, he told himself, Old Will isn't everybody's cuppy of tea. He bent down and sent his fingers flying over the terminal's keys. "Check this out."

This time he had called up an excerpt from a very recent Paco Redondo novel. Tomas stared at the screen and began to read.

" 'So OneNut decides he's going to fix Tapehead's fat ass for butting in and spoiling his chance to get at the sugar between Luz's chocolate thighs. He scores a couple ampships from one of the wireboys at the arcade, then has Tapey meet him at Adolpho's Grill and Bodega. He slides on until Tapehead's back is turned—he's drooling over some sweet motion flexing by on the street outside—and hots them in just like the wireboy said he should. Then he speaks up all icy and innocent-like, "We gots to have the Beat, Tapey. Where's the Beat?"

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" 'Well old Tapey grins and whips his blasmo upside his head, spins it to full scream and hangs a finger over the PLAY-bo like he's some sort of magician going to pull a fat Dole-check out of his hat. Then he punches in, grand and artful as hell.

" 'Them ampchips kick in bad as crocodile-covered concrete boots, blasting out a note so damn heavy it would take a dozen notcheros and a hand truck to haul it away. The 'ducers blow like mortars clean across the 'dega, taking the topknot off one surprised West Side Zulu, splode through a rack of skinmags sending them all flying like grenaded pigeons, and punch two holes in the wall big enough to rent out to a Chinny family, grannies and dogs included.

" 'That sound was so rock-on righteous that it blasted Tapehead's ear all the way round to the other side of his damn head, giving him this floppy heart-shaped thing on one side and just this big old scorched spot—' "

Tomas read on down to the tagline, where OneNut berates a dazed, deafened Tapehead for not keeping fresh power-pacs in his raggedy old blasmo. Then he eased back in his chair.

"Huh." There was a baffled look on his face and he scratched absently at the bare skin above his ears.

Walt was equally baffled. Redondo's vivid, street-flavored writing had hooked Rodrigo harder than any drug making the rounds in his neighborhood. He had raced through both novels, and even gone so far as to write the man, begging him to write another.

This should have been right up Tomas's alley. But he had read it in a dry monotone, and now stared at the screen, obviously perplexed. The only thing he could think of which might explain the boy's reaction was that he was fiction-blind, just like Anne. That had to be it, the poor kid was one of *Them*. The Writer's Bane. He cleared his throat to get the boy's attention.

"I'm going to move on, talk to some of the others. Later?"

Tomas shrugged. "Sure. Later."

Walt moved off to the next terminal in line. It was occupied by a chunky brunette with a bad skin-dye job, a mischievous, heavily made up face and a good pound of junk jewelry. A glance back at Tomas showed the boy still staring intently at the screen, reaching out to touch the page advance and reading on while wearing a frown.

Walt was talking to a fourth subject when Anne returned. He gave the man a quick goodbye and met his wife in the center of the room. She was grinning from ear to ear.

"It's all set," she said. Her big hands were restless, her legs and body moving constantly as if she was dancing to some interior music. "The testing starts at nine in the morning. By this time tomorrow I'll be halfway to a Nobel, just you wait and see."

She slipped one strong arm around his thin waist and pulled him to her side. "Ready to go home?"

Apparently the tour was over. It was barely three-thirty. "Sure. Just drop me off."

She shook her head, showing her big square teeth. "No way, buster. You and I are going to dress ourselves up and go out and have us some fun!"

That was two big surprises, one atop

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the other. She *never* left work early, and usually had to be cajoled into going out for drinks or dinner. He could only remember three or four times he had seen her so bubbly, only this time she was sober.

Well, she had good cause. What she had done deserved a bit of celebration. He tried to put the disquieting feelings he had gotten from talking to her readers out of mind and made himself smile. "Sounds good to me." That came out too subdued. He tried again. "I'm definitely up for raising a little hell."

Anne dropped her hand down to cup one thin buttock, startling the hell out of him. She brought her mouth close to his ear. "We might even work up some sort of sweat to shower off before we get dressed up."

She was in a rare mood indeed. The last thing he wanted to do was spoil it for her. He looped his arm around her waist.

"Well, what are we waiting for?"

Besides, a few drinks might help him relax and stop being so spooked by her readers.

Moody argent moonlight streamed in the skylight and pooled on the bed. The long, sweeping arch of Anne's back shone like molded platinum. The short blonde hairs at the back of her neck seemed made of silver wire.

He watched the strange and precious woman he shared his life with doze, strong drink and slow, tender lovemaking having sent her drifting toward a drug-deep sleep. Quite a bit more of that secret self she kept veiled from even him had been revealed. That she had taken him to MindSet was a mark of just how much she had come to trust him. Once more his patience had paid off.

He should have been at peace, but was not. The inside of his head felt like a city at rush-hour, a million thoughts rushing headlong in almost as many directions, the buzz, honk and hum drowning out the silence. Certain images kept recurring.

—Tomas punching up another page of Paco Redondo, reading it while wearing the face of someone taking apart some small, complex machine whose function he did not understand.

—Juney, the skin-dyed housewife reading a torrid passage from a Cara Mia erotic romance novel, never tripping over a word, grinding the sultry phrases to a grey powder with an inflectionless monotone.

—Spike, the denim and leather-clad biker-type reading some old, high-voltage Hunter S. Thompson as if it were the driest of history books. Yet when Walt had recited, from memory, another passage from that same book Spike had begun guffawing and slapping his knee with his tattooed hand by the third sentence.

—Ronda struggling over the phonetic pitfall of the word aisle, her halting voice catching as she read of the stranger's ascent to the pulpit, turning toward him her eyes all alight, whispering, "He must be an angel!"

—Anne laughing, "I'm still in love with Mr. Toad."

—Coming out of the bathroom to find her waiting on the bed, already naked, laughing as she purred, "Come take *me* for a ride, Mr. Toad. . . . "

—Ronda's awe, Tomas's bafflement.

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—Anne curled in a chair, devouring technical journals like candies. Speed-reading. Her recall all but eidetic.

—Anne never seeming to get far in any of the books he pressed on her. Even his own. *Especially* his own.

"—still in love with Mr. Toad."

He caressed the velvet knob of her shoulder. "Annie?"

"Ummm?" Her eyes mere slits, still more asleep than awake.

"You never told me you'd read *Wind In The Willows*."

"Never di' " She yawned and burrowed deeper, her voice sleep-muzzy and muffled by the pillow. "My da' read iddame. Now lemme sleee . . . "

Walt watched her eyes droop shut, heard her breathing deepen. A wave of tenderness swept through him, curling high on the wine he had drank all evening long. This odd, occasionally infuriating woman, this shy bundle of secrets had done a Grand Thing.

Yet the wave subsided and he was left with a sinking feeling in his guts. Its source remained just out of reach. He had drunk too much to think coherently enough to unravel the barbed-wire riddle burred to the back of his mind. But not enough to keep him from stumbling blindly around it, snarled in its loose ends like a fly buzzing at the end of a broken strand of spiderweb.

He lay awake watching the moon's sly face cross the skylight for quite a while longer, thoughts sputtering like strings of wet firecrackers until fatigue at last won out, and he fell asleep.

Only to toss and turn, plagued by vague, disquieting dreams.

His fifth cup of coffee had only made him more jittery. Rough snowballs of wadded paper littered the carpeted floor of his study, each inscribed with three or four lines before it was yanked out of his antique electric typewriter, crumpled up and flung away in disgust. So much for writing. Now he kicked at the paper balls as he paced, sending them flying and rebounding like his thoughts.

The riddle was all unraveled, which left him with the so far insoluable question of what to do about it—going on the assumption that he *was* right, and had any right to interfere. Pace. Turn.

Anne knows what she is doing, doesn't she? *Doesn't she?*

His gaze fell on the minicorder on his desk, the one he used to record ideas and dialogue. A lovely bit of engineering. Compact. Easy to use. It did the job it was designed to do perfectly.

But it was next to useless for music. No one would be pleased by the recording it made of singer or symphony unless . . .

They were tone deaf.

"To hell with this," he muttered darkly, going to the phone and telling it to call Ronda.

The guard outside the front gate touched his badge. "Dr. Howard, please." He eyed Walt and Ronda as they sat inside Walt's battered old Ford Electric with obvious doubt on his weathered face. His badge chirped.

"Dr. Howard here."

He stood straighter, as if she could see him. "Leo at the front gate, ma'am. Sorry to bother you, but your, um, husband and a Ms. Ronda Ellison want to come in to see you."

There was an uncomfortable pause.

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Walt could imagine the gears turning in Anne's head. He drummed his fingers on the steering wheel and gave Ronda a weak grin. She was clearly daunted by the guard beside the car and the others inside, the scanners and fences, the whole situation. He knew exactly how she felt. But he remained determined to follow through with what he had begun.

Anne's voice came out of the guard's badge again. "I . . . all right." A sigh. "Send them in."

Walt spoke up. "I have to see both Anne and whoever is in charge of today's tests."

She must have heard him. "I don't see why—" A three-beat hesitation. "Send them straight up to my office, Leo." She sounded angry.

"Yes, ma'am." He flashed the gate green after logging their names into his cuff-terminal, then bent to look in the car again.

"Drive up, park at the front of the building. They'll give you badges and directions just inside the door."

Walt nodded, putting the car into drive. The worn electric motor clunked, then hummed steadily as it carried them through the open gate.

"I'm still not sure what you want me to help you with," Ronda told him once they were out of earshot of the guards.

Walt let out a short, humorless bark that might have been a laugh as he guided his car toward the front of the MindSet building. "Wreck my marriage, most likely."

Ronda's brown eyes widened and the open book on her lap tumbled to the floor. "But I don't want to—" She reached over, grabbing him by the elbow as if to keep him from going through with whatever he had in mind.

He patted her hand. "Me either, love. Me either . . . "

He hung back for a moment outside the door to Anne's office, trying to gather his nerve and wits. He let his left hand rest on the reassuring weight of the books in his shoulderbag, then taking a deep breath and squaring his rounded shoulders, reached for the knob. He felt like one of his own characters, just about to step into an unknown situation which might be well past his ability to cope. What were his odds for a happy ending?

Forcing a smile, he turned the knob and pushed the door open. *Mr. Tennyson goes to war.*

Yesterday's tour had ended before he had gotten to see Anne's office. It was an airy, L-shaped room, its walls covered with books and framed diplomas, neutral colors and wood-tones, so neat as to seem almost sterile. The long far wall was given over to plant-filled picture windows framing the rolling plains outside the MindSet compound. Her empty desk sat before the window, the only thing on its polished walnut top a framed triptych facing the high-backed leather chair behind it.

Moving further into the room, he saw that the leg of the L was a conference room, a long walnut-topped table at its center, chrome and black leather Gazzi chairs spaced around it.

Anne rose from a chair on the window-side of the table, her face carefully expressionless, her big hands flat on the table. He saw that one of her cigars burned in the ashtray before her. It ap-

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peared to have been lit only in the last couple of minutes.

A bald, heavy-set oriental man in a grey silk suit heaved himself up out of the only other occupied chair, his broad, buddha's face breaking into a sunny smile. A black Hikita lap-top computer was on the tabletop at his place, words and numbers crawling across the screen like ants.

He held out a pudgy hand covered with rings. "Randy Phat."

Walt nodded, his guess that the man was of Vietnamese extraction confirmed. Second or third generation judging by his mild Okie drawl. He offered his own hand. "Walt Tennyson."

Phat's eyes all but disappeared in the folds of flesh surrounding them. "I know—I'm a big fan of yours. I've probably read *Darkling Harvest* a dozen times. Same goes for *Lucretia's Ghost* and *Steps In The Night-Dance*." He shook his shaven head. "Damn, but this is a treat."

Running into a fan was about the last thing Walt had expected, and it put him off stride. "Thanks," he said, ducking his head. "I'm glad you liked them." He drew a reluctant Ronda up beside him. She glanced at the man from HEW then went back to staring at her feet. "This shy lady is Ronda Ellison."

"One of Walt's literacy volunteers students," Anne put in, drawing the center of attention to herself. "I'm afraid they can only stay for a minute. But it was so *good* of them to drop by." Walt saw her watching him warily, knowing something was up and sensing that it might be something she liked even less than his trespassing on her preserve. Her face and pose screamed resentment.

Randy Phat looked from one to the other, unable to miss the tension. But he spoke as if nothing were amiss.

"I don't know the reason for the honor of your visit," he told Walt heartily, "But you're in the right place to see history being made." He patted the lap-top. "These numbers are realtime results of the testing of your wife's pattern subjects. They're past all expectation. This looks to be as big a breakthrough as patterning itself. You should be real proud of her, Mr. Tennyson."

"Walt," he replied automatically. "Call me Walt. And I am more proud of her than I can say, but—" he made a helpless gesture. How to put it?

A frown had crept out onto Phat's round face. Anne was tight-lipped, tracking him like a moving target. Her broad shoulders were stiff under her mannish jacket and her hands were shoved into her pockets. By the bulges they made he knew that they were curled into fists. Ronda stood off to one side, looking like she wished she were invisible.

He knew how she felt, but he forced himself to plough on. "But there's something wrong with the pattern. It would be a horrible mistake to approve it. A *disaster!*"

A long silence ensued, the only sound the nervous shuffling of Ronda's feet and a gutteral hiss from Anne. Walt kept his eyes on the man from HEW, afraid to look at his wife for fear he would lose his nerve. The big man blew air though his thick lips, his cheeks puffing like balloons.

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"That," he said mildly, "is quite a statement, uh, Walt." He pointed at the Hikita's screen. "The results we are getting tell us that it is anything *but* a disaster. The numbers leave no doubt as to the the level of skill they have acquired."

Walt ducked his head. "I know. Anne and her people have performed a miracle; I won't argue with that. But the patterning is badly flawed. It will ruin—yes *ruin*—the lives of everyone who uses it!" He had to stop, his voice had been rising, becoming shrill. Getting hysterical would be no help.

"I can see that you feel pretty strongly about this," Phat said gently. "Let's sit down and talk it through. I'm sure we can ease your mind." He settled his heavy body back into his chair, indicating that the others should sit as well. After giving her teacher a fearful glance, Ronda went to the far end of the table and sat. A moment later she pulled a dopestick out of her purse and lit up, turning her chair to look out the window as she smoked.

Walt perched uncomfortably on the edge of the chair at the table's head, putting himself at the point of the triangle formed between himself, Phat and Anne. She sat stiff as a mannequin on his right, her face a wooden veneer glued over anger and resentment.

"I'm sorry," he murmured, looking down. "I had to come, love. Once I understood what your pattern did to those people there was no way for me to stay away." He looked up to search her face for any sign of understanding or forgiveness but found only reason to despair. He bowed his shaggy head. "Please listen and try to understand, that's all I ask. You know I wouldn't be doing this if I didn't think it was important."

Anne only took a long drag on her cigar, not even blinking when the acrid smoke curled into her condemnation-filled eyes.

Walt sighed, turning back to Phat. He was the key, the one who had to be convinced. "I know that the decline in literacy is a major problem," he began.

Phat shook his hairless head. "*The* major problem. It is the bedrock upon which all education is built, and lately that bedrock has turned to quicksand."

He rubbed his dimpled chin. "It's a paradox. In a televised, iconographic world where machines talk, it would seem that the average citizen needs to be able to read less and less every year. And yet the number of jobs which don't demand enough of an education for cramming have dwindled to a mere handful.

"Cramming may have revolutionized higher education, but our primary and early secondary education system is even worse off than the one of forty years ago. Pattern-aided education allows us to train very good teachers, but too few choose that line of work. Those who do find themselves in such a bad situation that they are soon driven to move on to better-paying jobs with fewer headaches." He spread his chubby hands. "Who can blame them? Why stay in the Combat Zone trying to maintain order over a bunch of kids who've been TV taught that being on the Dole is just fine, when a few months of cramming can move you up to college level or a whole new career?

"But this," he stroked the Hikita,

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which was still quietly displaying the results of the Pattern Testing. "—is the answer we've been looking for. Instant literacy. A way to cram the whole range of subjects in the grades. Our public schools can finally become something other than Doloid factories."

Walt knew how tha man felt, when he had first seen Anne's results he had reacted in just the same way. The task he now faced was to make the man see what he saw, and hope that Anne could somehow understand it as well.

"I agree with you on all but one point. This isn't the answer. The people who've used the pattern can read, but they can't *read!* They're still illiterate."

Phat shook his head. "That doesn't make any sense."

"It's a tricky point," Walt admitted, "But an all-important one. Would you be willing to bring one of the patterned readers in here so I can show you what I mean? I want you to see for yourself."

Anne spoke up at last, a cold, sharp, broken-ice edge to her voice. "This foolishness has gone on long enough. I have no intention of letting the test run be invalidated."

Walt spun to face her. "But it's invalid as it stands, dammit! That's what I want to show you. That's why I brought Ronda along, she might flunk that test but she knows how to *read!*"

Anne pushed herself to her feet, her back ramrod straight and her hands flat on the table. She towered over her husband, and the anger smoldering inside her began burning through her impassive facade.

"I've had enough of this crap," she hissed, leveling her finger at Walt's face like a gun. "I bring you in here for the first time just yesterday, and suddenly you're a goddamn *expert!* You come busting in here with this crazy bullshit, and let me tell you, mister, I won't have it!" She jabbed her finger at his face. "I *won't!*" She slapped her hand back down on the table.

Walt tried to touch her but she pulled away. "Anne, I'm not saying I know *shit* about patterning! But I know reading, and I know you'd never see what I'm getting at on your own because you're just as illiterate as your pattern readers!"

Her big strong hand was a blur as it snapped up off the table and whipped across his face, the *crack!* of flesh on flesh loud as a gunshot. The blow racked Walt's head back and flung him against the back of his chair. Through the distorting lenses of the sudden tears in his eyes he saw his wife drop back into her own chair, anger and shame fighting for supremacy on her bloodless face.

"This is, ah—" Phat searched for a word which would adequately cover the situation but could find none. "Well, I think we should all calm down, first off. I'm not quite sure what you're driving at, um, Walt, but I must admit that you've made me curious."

He swung his gaze toward Anne. "Would you be agreeable to bringing one of your people in here for this demonstration which your husband feels is so important?" He held up his hand to keep her from interrupting. "If there is something, um, lacking from our procedures, it behooves us to find out now, rather than later. Will you agree to this?"

"Yes." She spoke distantly, as if the

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matter had ceased to be of any importance to her.

Walt put his hand on her arm. "Pick your best reader."

Once more she pulled awy from his touch, her lip curling in disgust. She said, "I trusted you," in a grave-cold voice and then, without another word, she got up and stalked off.

Phat clasped his hands across his vast belly, suddenly very interested in the numbers on his computer's screen. Walt turned toward Ronda in time to see her look away, staring out the window and biting at her lower lip.

Anne brought Tomas back with her, the whip-thin Latin boy's face carefully expressionless as she turned him over to Walt. She went back to her chair without a word and lit a fresh cigar.

Walt put Tomas and Ronda next to each other at the side of the table opposite his wife, and had Phat take the end chair he had occupied. Speaking quietly, he told the two young people what he wanted them to do. Then he straightened up to collect his own thoughts and size up his audience and players.

The HEW man slouched back in his seat, his moon-face bland but his hooded eyes watchful. Anne sat as rigidly as a statue, her hands primly folded before her, wearing the face of a hanging judge. Tomas maintained an air of cultivated diffidence, tapping out a soft rhythm with the fingers of one hand, and poor Ronda looked like she was going to be sick at any moment.

He picked up one of the books and held it to his thin chest. He was at least as nervous as Ronda, but hoped he was doing a better job of hiding it. He had to get this right; there was no way for him to calculate the price of failure. His marriage was hanging by a single thread as well, but he dared not dwell on that. As much as the thought of losing Anne frightened him, he had to go on. *Had to*. He'd worry about picking up the pieces afterward.

One deep breath, then he took the plunge. "Okay. Tomas was testing out at a college-entrance reading level, correct?" Phat nodded. Anne made no sign that she had even heard him. "And if I hadn't interfered, the test results you were getting would have led you to approve the patterning. True?"

"Yes," Phat answered, "—after a computer breakdown for interdicted content and sim-testing. The testing procedures for reading skills is fairly simple. The testing for more complex patternings would be much harder, more involved."

"Right. Now, Ronda here," Walt stood behind her, resting his hands on her shoulders and feeling her tension. She craned her neck to look up at him. He gave her the best smile he could manage under the circumstances before turning his attention back to Anne and Phat.

"—tests out somewhere around the sixth grade level. But she can *read*. Her skills, even though poor as defined by your test, are whole. Poor Tomas's are not. Let's see if you can tell the difference."

He handed the book he was holding to Tomas after opening it to the place he had chosen. "Please read this, *amigo*."

Tomas did as he was asked and began

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reading Twain's *The War Prayer* aloud. There had been just time enough to help Ronda read though the second half and go over the words she didn't know during their ride to MindSet. But it was powerful and evocative enough to make his point. Or so he hoped.

Tomas read it, word after word, never tripping, never mispronouncing. But even though his voice was a good one, his metronomic monotone turned the rolling phrases into something as flat, dry and grey as an Oklahoma road.

The boy's handsome face was expressionless as he recited the words before him. They left him untouched and unaffected. He might as well have been reading from the telephone book.

Phat was frowning as Tomas's reading droned on, rubbing his generous mouth and fidgeting in his chair. A guarded expression had come onto Anne's face. He had read that piece to her once before, and she knew its power and poetry.

Walt found it actually painful; it was like hearing a symphony over a string and tin-can telephone. Ronda was biting her lip and shaking her head. Her hands twitched restlessly, as if she wanted to snatch the book out of the boy's hands before he killed the thing he was reading altogether.

Walt let Tomas read a ways into the angel's speaking of the unspoken prayer sent up by the people in that church.

"That's enough, Tomas," he said gently. "Thank you. Now let Ronda read the rest." The boy handed the book over as if eager to be rid of it.

"All right, Ronda," he said, bending like a question mark and looking into her brown eyes. "Forget everyone else is here. There's just you and me and Mark. Can you do that?"

She nodded soberly. Licking her lips, she began to read in a halting voice not much louder than a whisper.

" 'help us to lay waste their hum-ble homes with a hur—hur-ricane of fire; help us wring the hearts of their un-of-fend-ing widows with una—unavailing grief—' "

Her voice took on a huskier edge, her hands gripping the book tightly. " '—help us turn them out roofless with their little children to wander unfriended the wastes of their des—desolated land in rags and hunger and thirst, sports of the sun flames of summer and the icy winds of winter—' "

Her voice had grown louder and stronger with each word, now they fell with the certain weight of gravestones, all quavering gone. Phat was sitting forward, nodding as the music began to break free. Anne's face was tight and strange, her hands were fists. Tomas was watching the intent black woman beside him with growing awe, his eyes shifting between face and page to see what she was seeing there that he had not seen. Ronda's voice rose like a trumpet over the hush.

"—'*broken* in spirit, *worn* with travail'," Travail became travel but it did not matter. " 'im*plor*ing Thee for the refuge of the grave and *denied it!*—for our sakes who adore Thee, Lord, *blast* their hopes, *blight* their lives," Tears were running down Ronda's cheeks now but her passionate reading never faltered. " 'Protract their bitter pilgrimage, make *heavy* their steps, water their way with their *tears, stain the white*

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snow with the blood of their wounded feet!' "

She paused for breath and Walt gently took the book from her hands, bending down to kiss one wet dark cheek. "I'm proud of you, love," he told her tenderly. "I only wish old Mark could have heard you read that."

Tomas reached for the book and Walt handed it over. The boy raced through the print to the place where Ronda had taken over the reading, looking for the music but finding only words laid out one after another in cold precision. He looked cheated.

Walt turned to face Phat. "*That's* reading."

The HEW man sighed. "Tomas knew all the words but they never touched him. They never became anything more than just words."

Walt's shoulders slumped. Suddenly he felt very tired. "All the pattern readers I talked to are the same way," he told Phat. "They can read, but only in the most limited sense of the word. The magic which makes reading so special is missing for them—*from* them. I don't know why."

He scrubbed his beard with a sweaty hand. "All I do know is that a generation blinded to fiction and poetry is a generation damned to a fate too horrible to contemplate. It's not enough that they know the words. Giving them this would be worse than giving them nothing at all."

Phat nodded. "They probably wouldn't bother to keep reading. If this had gotten passed . . . " He shuddered. "There might have even been a backlash against fiction. Denying that it could mean anything or bring pleasure."

Walt saw that he understood. "That's the heart of it. How many times would you have read my books if they'd given nothing back?"

"Never," Anne said, drawing their attention to her. She sat stiffly, staring at her hands. "He never would have finished any of them. They would have . . . baffled and angered him because they remained opaque to him. He would have . . . sensed that there was something special hidden inside them, some tantalizing, taunting something which . . . always stayed just out of reach." Her voice rose. "He would have begun to resent—to deny—to *hate*—"

She shook her head and hid her face in her hands.

Phat stood up, his buddha's face sad. "I think I'll take these fine young people down to the cafeteria for a cup of coffee or something. The two of you need a chance to be alone."

He gathered up Ronda and Tomas and ushered them out, his huge arms around their shoulders. Ronda looked back just before they turned the corner, her heart-shaped face tragic.

Moments later the office door closed and they were alone. The black Hikita sat on the tabletop, still reading out its meaningless test results.

Walt crouched down by his wife, his hand almost touching the tight curve of her back before he let it fall to his side.

"I'm sorry," he whispered. "I didn't do this to hurt you. Just—just say the word and I'll go. Is that what you want?"

His answer came when she flung her-

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self against him, nearly knocking him over, weeping as deeply and quietly as one in mourning. Her strong arms held him tight enough to hurt, her tears were hot against his chest. Tenatively at first, he returned her embrace.

After a minute or two she turned her tear-stained face up toward him. "Please teach me how to read. Me and Tomas and the rest."

"What about your pattern?" he asked softly.

Her mouth quirked in a rueful half-smile. "I don't know yet. Maybe it can be modified. Maybe I'll have to start from scratch." Her face took on a thoughtful look. "Maybe it's just a matter of after-pattern tutoring. Maybe the flaw was in the actualizing. Maybe—"

"Annie?" Her eyes focused on him once more. He smiled and stroked her hair tenderly. "Toad's School starts tomorrow night."

"Then we'll start there," she said, resting her face against his chest and holding on as if she would never let go. "Tomorrow." ■

Quotation on page 87 reprinted from HOW TO TELL YOUR FRIENDS FROM THE APES by Will Cuppy. Copyright 1931 by Horace Liveright, Inc. Copyright renewed 1959 by Liveright Publishing Corporation. With permission of the publisher, Liveright Publishing Corporation.

IN TIMES TO COME

● Next month's cover story is something that has become a rather rare commodity these days: a colorful space opera set against a background that feels big and sweeping even though almost all the action takes place aboard one ship and much of the universe it plies is, by its very nature, only dimly perceived. It's Reginald Bretnor's *The Taste of Blood,* concerning a decidedly diverse group of human beings on a decidedly peculiar mission through Gilpin's Space, a short cut through our space which travelers have learned to use but do not fully understand. Among other things, travel in Gilpin's Space has psychological effects which most people find intensely distressing. But not all human minds are alike, and neither are their reactions to a given stimulus. And therein lies a danger. . . .

Thomas Donaldson has another of his mind-stretching fact articles, this one about ways our descendants will deal with a whole group of dangers, most of which we already face—some of them so routinely that we take them for granted and seldom even think of them as "dangers." It's called "24th Century Medicine," and while the date may not be exactly right, the techniques seem very likely.

And, of course, we'll have Part II of Charles Sheffield's *Proteus Unbound,* as well as shorter stories by Elizabeth Moon and others.

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on gaming

Matthew J. Costello

Once again, it's disclaimer time. This will be a review of the new game, *Isaac Asimov's Presents* **Star Traders**. And yes, I also write a gaming column (almost as witty and insightful as this one) for *Isaac Asimov's Science Fiction Magazine*. (And yes, there are certain games that I would review for one magazine, but not the other. But ask me about that some other time.)

So I can't very well pretend to be giving an objective review, now can I? Except that this isn't really about the game, and reviews, at all. No, it's about meeting legends.

I first played Star Traders (Steve Jackson Games, Box 18957, Austin, TX 78760) in an early stage as a prototype. The board seemed done, the cards were dot-matrix printed on cardboard, and Steve Jackson's business manager had the latest incarnation of the rules.

It was a good game, always a dependable fact when dealing with a design from Steve Jackson. There were a few problems . . . the layout of the board, and few vague areas in the rules, and the need for what game designers call "bells and whistles" . . . small touches to enliven the game.

But, as I played the game with some people from the magazine, it was clear that it was an entertaining, involving game.

Time passes . . .

Another play-test was set up, this time to be held in none other than Isaac Asimov's apartment. Steve Jackson would be there with a final version of the game, to see if it passes the good Doctor's inspection.

And I was thrilled. I mean, I had seen Dr. Asimov at various SF functions. But this was going to be a tad more intimate. And though I am well past the age where sheer celebrity impresses me, I was humbled. Here was the man who wrote the Foundation trilogy, one of my best-loved reading experiences. (Will I ever forget the Mule, or the whole tremendous scope of the Foundation books?)

Quite simply, no.

And here I was to sit around a table and play a game with him.

Well, I need not tell you how astounding it is to see all the awards that decorate the shelves, or the special editions of his books. We played the game (with many of the suggestions from months before put into place) and, for an hour, we could all have been at Uncle Al's for an evening of Monopoly.

Only, I told myself after we left, that we weren't.

And that's the incredible thing. That genius, that most inspired and inspiring of human qualities, leaves no great trails in its wake, except its vision of wonder and beauty in a world often starved for both.

Having said that, and realizing my bias, just how is the game?

Well, Isaac enjoyed it and seemed

(continued on page 192)

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TOUGH CUSTOMER

Laurence M. Janifer

When is a strength a weakness?

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Toni looked at me with a very unsmiling face—which was unusual all by itself. Toni's one of my dependable smiles, if I happen to be on Earth and in the neighborhood—and said flatly: "Knave, I've got troubles. I hoped you'd be around."

Until that minute, so had I. I like to cook—and very few people seem to, these days; things are too easy, what with six things and another, and if you do happen to get stuck with something raw that needs five or six hours of work, there's always your trusty Robbie, as guided by your even more trusty Totum. But I also like to drop in on a good restaurant, cafe, dining establishment —or even something like Toni's, just as often as time and money will permit. (Her *name really is Toni, by the way; she has* a thing for preSpace names, and who am I to say a word against it? She spends a lot of time thinking about the good old days, for some reason, and now and then it can get infectious, though reminiscence is not recommended for a Survivor; while you are misty-eyed, almost anything can come along and bash your head in, or do something equally unpleasant.)

About dining establishments in general: for one thing, they're a fine place to pick up some new ideas for your own cookery (I swear I discovered Key Lime Pie in a restaurant, some years back —about halfway back toward the good old days, I should think—and while everybody has heard of Irish coffee, which is overrated, it was in a cafe I fell over a man making coffee with that ancient blend called Southern Comfort—highly superior, as long as you don't make it with one of the very sweet coffees like Kona), and if you often discover How Not Tos, this is only an example of Sturges's Law. Or Sturgeon's Law. One of the classic story people, at any rate, the one who said that ninety percent of anything needs curing.

Toni was looking at me in a helpless, grim sort of way, and I said: "Personal troubles?" and she shook her head. Sort of.

"Not exactly," she said. I felt immediate relief. Personal troubles involving lovely ladies are not exactly my cup of Southern Comfee, so to speak. "It's something—different. Very different."

"Fine," I said. "Tell me. You're not busy right now, and what else have I *got to do, this particular minute, but* listen?"

The place had an effect on me. I never talked like that anywhere else.

Toni said: "It's very odd. Weird. Strange. Maybe it's not worth bothering you with—"

"So go and get the food and sit down and bother me," I said. "Whatever the story is, it might help me digest. And with this food, I need all the help I can get."

See what I mean?

It wasn't Toni's place. She just worked there. They were big on Authentic Human Service, making an attempt to recreate something they insisted was called a Delicate Fresser, though the name doesn't make a great deal of sense.

At any rate: pastrami, cured turkey, corned beef, pickles, all that sort of thing. They even had something called a Health Salad, of which I ate about half one afternoon, I remember, that being

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as healthy as I could stand to be just at the time.

And decent coffee. Somebody back in the kitchens of the place—not a machine, I guarantee you—had the Touch. Delicate Fresser or whatever it was, that alone was worth putting the place on my list.

So, on this particular trip, mostly devoted, alas, to reporting in for any new assignments that happened to be going, I made a point of dropping in at Gan Eden, which was what they'd called the place. It was mid-afternoon and I was in the mood, I told myself, for great unmanageable sandwiches of corned beef, for tomato pickles, for one more try at their horrible pastry (according to Toni, horrible pastry was a Delicate Fresser tradition) and several cups of their remarkable coffee. I was also in the mood to see Toni again, hoping she might cheer me up.

She did a lot of talking about the good old days, true, but she didn't look old enough to remember any of them. She was a teeny woman, nicely and solidly built, with off-blonde hair and a smile that hinted at better things than were to be found on any menu, and she might have persuaded customers to spend a lot of time in a restaurant called the Horrible Food Place.

I came in and found a table and sat down, and after five or ten seconds—the place was between the early rush for lunch, or something and the dinner rush—Toni came over and I told her what I wanted, and before she went off to find my sandwich, bowl of pickles and coffee—the pastry always came later, which gave her time, I think, to sit it out on a shelf somewhere and let it harden—she Unsmiled at me.

And ten minutes later (good corned beef sandwiches take time, thank God), she came back, distributed food and coffee (with cream and Southern Comfort, sugar not necessary) and the obligatory little plastic thimble of chopped cabbage. A Delicate Fresser, she's explained to me once, served this Cold Sluff to every customer, ordered or not. Part of the tradition.

I had no objection, as long as I didn't have to eat the stuff, and Toni had explained that (equally traditionally) nobody ever did. I don't wonder. There are several interesting things you can do with cabbage, but making Sluff out of it, Cold or Red-Hot, is not one of them.

She'd brought herself some coffee (sugar, no Southern Comfort) and a pastry I didn't recognize and didn't much want to; it looked like a flying saucer, if you remember that argument, which had begun to bleed in the center, and she told me much later it was called a Cheery Danish. God knows why.

"He came in about two months ago," she said once we were settled, "and ordered berries, sour cream and coffee. Nice-looking man, in his early forties maybe, maybe his middle thirties. Nice smile, you know what I mean?"

"Friendly type," I said.

"Friendly, but very quiet," Toni said. She took a bite of her Cheery D. After a second she went on: "I don't mean everybody has to have long conversations. That's not what a restaurant is for, any sort of restaurant. But he seemed—extra quiet. I don't know."

"Did he say anything?" So far, noth-

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ing at all was strange about this customer. Not even odd or weird.

"Well, he ordered. He said thank you. Maybe another few words. Nothing to remember, nothing special. Just the usual."

"And?"

"And he sat there and ate and drank, and when he was still eating I dropped the bill on his table—" The Delicate Fresser goes in for real bills, made of real thin paper, none of this memocredit stuff; I doubt they even have a bank tap—"and I didn't notice anything special. And I would have, don't you think?"

I shrugged, my mouth full of corned beef sandwich. When I had swallowed, I said: "It depends."

"I'd have noticed," Toni said flatly. She looked grim, and a little bit frightened. Somehow, I didn't think it was the effect of the Cheery Danish. "And I had to drop the bill off, because we were busy right then. He came in right after the lunch rush started, and you know how that is."

I knew how that was. Delicate Fresser customers tended to be picky and impatient, not a good combination if there are a lot of them all at once. "Sure. But where does the oddness come in?"

"After he'd gone," she said.

"He didn't pay the bill?"

Toni finished her Cheery D. and shook her head. I was down to the coffee myself. Well, maybe one more nibble of tomato pickle. Maybe two. "Nothing like that," she said. "I checked. But that was after I'd noticed."

I think it's the influence of 3V: nobody tells a story straight. They always save out the big fact for suspense. Or something. "Noticed what?" I said, trying not to sound impatient.

"His bowl was gone," Toni said. "And his saucer."

I blinked.

"That," I said, "doesn't make any sense at all."

Toni nodded. "Weird, isn't it?"

"Odd, you might say." I swallowed some pickle. "Even strange."

You might need one additional fact along here in this report. There was nothing special about the bowl, or the saucer. They were plastics, cast to look like antique ceramic dishes, and the Delicate Fresser had hundreds of them. Maybe thousands.

And there was no chance of somebody slipping a secret message inside the bowl and saucer—even if there'd been a way to guarantee that this odd customer would get that particular pair.

Of course, the message might have been somewhere in the decorations of all the bowls and saucers in the place, as originally made, just waiting for this one man to stop in. . . .

I thought about that for a second, and the longer I thought the wilder it sounded. Then I said: "That's quite a story," and Toni said: "That's not all."

I blinked again. I took in some coffee, and Toni said: "Back in a second," and went away to get some more for both of us.

Fifty or sixty seconds later—she was not only admirable, she was an admirable Waitress, which is what that category is called if a human being holds it—she was back and we were fixing our new coffees to taste. She'd even remembered the pastry; she had another

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bleeding flying saucer, and I had something that looked like a pastry triangle, had fruit inside it, and tasted as if the filling had been carefully put in with a great deal of glue to keep it from rolling around in there. Toni said it was a turnover, though what it had to do with rocketry I couldn't imagine.

After a ritual bite or two at this stuff, she said: "Naturally, I thought I'd been mistaken, or something."

Well, it had occurred to me—on a busy day, after all. She'd taken the plates away and forgotten she'd done it. But I hadn't wanted to mention that in front of a friend if there were any tactful way out. "It's always possible," I said, and washed down some glue with good coffee.

"But he came back," she said. "A week later, a week exactly. And that time, nothing was missing."

This did not seem evidence of anything much, and, in a tactful sort of way, I said so. Toni smiled at me for the first time, but it wasn't a cheerful smile. It came and went in a flash, and then she said:

"A week later he was back. And when he left, a cup and saucer were missing."

"No bowl?"

"The bowl was there. The cup and saucer were gone. And the week later—"

"Nothing was missing," I said, beginning to see a pattern.

She shook her head. "The bowl was missing. And one spoon, the one he'd eaten his berries and sour cream with."

I took a deep breath. I was hearing nonsense, and the simplest explanation was that Toni's mind was rapidly turning into mashed Cheery Danishes. But—worried and tense and unhappy —she looked no less sane and intelligent than she ever had. I took in some more coffee, nicely flavored with Delicate Fresser's real cream and Southern Comfort, and when I had it down I said: "How many times did this happen? And just what was missing each time?"

"The last time was a week ago," Toni said. "He comes in once a week. Like clockwork. And sometimes there's nothing missing. Once it was the pair of tongs in the pickle bowl." (Thin metal tongs, made rather broad. As I say, the place was full of tradition —which may be what had started Toni on the road to the good old days in the first place, when I thought about it. Tradition tells more lies than liars do.) "Last time it was just the cup."

"What was the total?"

Toni shut her eyes to think. After a minute she opened them and said: "Two bowls, five saucers, three cups, six spoons—one bowl spoon, one coffee spoon—and one tongs."

Two five three six one one, I said to myself, and realized that, as a decimal, it was the inversion of (approximately, because I was doing all this realizing in my head) 3.943. This did not seem like a helpful fact, especially since we were dealing in the total rather than an ongoing series of events—if there were any sort of meaning in the numbers, it seemed likely that it would lie in the numbers as they occurred, and the whole thing seemed one of those billion-to-one chances you read about, the sort of thing 3V heroes are always coming through with in the last thirty seconds —and since, in any case, we had no idea whether the series was over.

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The whole sequence of thought told me how desperate I was. I drank coffee and thought, and then I thought and drank coffee. After a while the only sensible question, thank God, came to me.

"When was he in last?"

Toni said: "It'll be a week tomorrow."

I was supposed to report to Extra-Comity Outgoing at ten in the morning. Given the nature of your average bureaucrat, there was no chance I would be out before four or five in the afternoon.

But I could postpone the appointment. I could say that something vital had come up.

I was sure I'd be able to think of *something vital between then and ten* in the morning. Five or six somethings vital, if necessary.

"I'll be here," I told Toni. "Just before the lunch rush starts. When he arrives—"

"I'll point him out to you."

"You'll do nothing of the kind," I said. "Why make people suspicious? Just give me a fair description now, and I'll wait for berries and sour cream and coffee during the lunch rush."

Toni finished her coffee and nodded. "Whatever you think," she said.

Which was extremely kind of her, because, at the moment, I didn't think anything at all.

I mean: what was the motive for stealing a fair amount of assorted plates and silverware from a restaurant? Especially when none of it had any value to speak of?

There's always insanity, of course.

But I was determined not to give in to it except as a last resort. If I absolutely could not figure out what the Hell was going on—*then* I might consider insanity.

And even then, only if I knew of a place to check into, once I'd become insane, that served decent coffee.

I went home and considered the facts as I had them.

The only addition was the description: about six feet, brown wavy hair, middle thirties to early forties, fairly handsome in a very young-looking way, dressed in coveralls, very graceful in movement, very soft of voice. Light baritone. No eye color, no list of visible moles or scars; Toni hadn't noticed eye color, and hadn't seen any visible moles *or scars*.

After a bit I called ExtraComity Outgoing and told them something had come up. I won't detail it; I may have to use it again some time. I said a week or so would do it, because if I couldn't figure the situation out in one visit by this customer, two at the most, sixty visits weren't going to help.

The trouble was that I kept having the notion it was something very, very simple.

The further trouble was that this notion came from the back of my head. The back of my head is much smarter than the front of my head, and I try to attend to it as carefully as I can.

Unfortunately, it was telling me something that didn't make sense.

If the explanation was a simple one, why hadn't I seen it?

And if it wasn't, why was the back of my head lying to me?

I went to bed early.

Sleep—well, no.

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* * *

About four in the morning I gave up and went to make myself some more coffee. In the middle of preparations, a question surfaced, and I thought of asking Toni early next morning, long before the lunch rush: had she noticed any other customers who came in, week after week, when our mystery guest was doing his thing?

After five or ten seconds' consideration, I abandoned the question, because the only answer would have been: "Sure. Lots of them." Delicate Fresser was a habit for God alone knew how many people around the neighborhood, and those people were of all sorts and occupations; the neighborhood included living space, office space, a couple of lab buildings inhabited by maybe five hundred researchers in this, that and the other, plus assistants, secretaries and other impedimenta—name it and the neighborhood had it. And a fair proportion of the neighborhood had made the place a habit, more or less.

The odds were that fifty other people had been in, each and every week, when our mystery customer had been in. The odds strongly suggested that eight or ten of those hadn't been in at any other time; habits work that way.

Oh, God. I could, of course, check with Toni, and I determined to do that, but I couldn't imagine what good checking would do me; an answer that went against those odds would provide a question even stranger than the one I was fumbling with.

I went back to my coffee. Everything scrubbed clean: check.

Fresh beans unfrozen: check. (I was making pure Colombian, fairly harsh and very strong, as what I thought might be an aid to contemplation.)

Water, salt, drip processor: check.

Grinder: check.

I realized I had one explanation in my head. It made no sense, but there it was.

Suppose Toni's customer was trying to furnish an apartment? A bowl here, a spoon there, a cup or so . . . what the hell, you have to start small.

But skipping one meal at the Delicate Fresser would buy you the Hell of a lot of cheap dishware. Tradition seldom comes cheap, after all. It was just the sort of explanation, I thought I could recall, that might have proved out when Delicate Fressers were fairly standard and fairly inexpensive, but not any more.

Oh, Hell.

I put the beans through the grinder, poured the result into the paper cone of the processor, added a sprinkling of salt, debated cinnamon and decided against it (not with Colombian coffee), and filled my boiling-pot with water.

I didn't watch the pot. Tradition.

After six or seven years it began to boil. I poured in enough to wet the beans thoroughly (and dissolve the salt nicely) and waited.

Then I started to pour in the rest—four cups' worth.

And my foot slipped.

Very suddenly I was covered all over by very hot water.

This is not amusing. I screamed for the fastest available Robbie. While it was on the way I was trying out a nice line in curses and obscenities.

When it arrived I told it, in a slightly less frantic voice (but only slightly), to salve my hand, arm and most of my

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right side (I'd stripped while waiting, getting rid of a lot of wet and painful clothing in a hurry, and checked that my slug gun was unharmed; I don't sleep naked in either sense, not when alone, because I may not be alone at any minute, precautions notwithstanding). The Robbie used both hands to do that job, getting the salve as usual from its necessities module (where I keep every bit as odd an assortment of stuff as any of you do).

The stuff works very quickly on minor burns. In a second or so I was even in the mood to call the burns "minor." Meanwhile, I'd told the Robbie to fill the pot again—after a quick rescouring—with fresh clear water, boil it as fast as possible, and finish the coffee-making. Time was passing and the coffee would be, at best, only fair, but the back of my head kept telling me I was being stupid, so maybe I didn't deserve any better.

The Robbie picked up the pot.

The pot dropped—a glitch, maybe; it should have known enough to clear its hands of the salve first.

With the pot in midair, the Robbie made a grab for it, added in the fact of the salve, increased pressure on its hands to balance that, and after a nice catch, stood for half a second holding a badly dented pot.

It began to fill this modernist sculpture with fresh water.

I almost stopped it long enough to kiss the damned thing, on top of getting a new pot.

It had told me everything I had to know.

And the back of my mind was saying (free translation): "That's right. Now—what took you so long?"

There are two things I always carry with me. One of them is that slug gun. (I usually add a beamer as well, and in fact had one that trip, but it comes into this report even less than the slug gun does, so why mention it?)

The other is a field distorter. It's useful for all sorts of things: it will snarl almost all ears that happen to be planted near you, any frequency, any theory; it will stop or slow down any mech that happens to be bearing down on you; it will make some instruments give very funny readings. (If I leave it on by mistake at a medical checkup, I have the temperature, according to a medical Totum, of the inside of a dwarf star, and a blood pressure of 400/12. I made that mistake once, and it was my own Comity medic, so I managed to explain things to him after only an hour or so of fulminations and confusions. If it had been a Comity bureaucratic service medic, I might still be explaining.)

When I went into Delicate Fresser, I had it switched on. For all I know, I blocked nine ears that were narrowcasting the food orders of some of the businessmen, or maybe some of the researchers. Or maybe information about the recipe for that coffee—which would do them, whoever was on the other end, no good at all, because you have to have the Touch.

But I meant it for something else.

I had it turned to high gain. It covered the room nicely. It would have stopped the average Constructor's Destructo mech, if anybody around had been tearing down any buildings.

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When the customer came in, it only slowed him down—that was one powerful structure. A tough customer, you might say.

He walked in looking perfectly natural—a remarkable job. I silently congratulated the unknown researcher who'd been doing the work, and cursed him all over again at the same time; what a hell of a way to field-test his mech!

He managed four steps. The third and fourth were distinctly slower.

He got to a table by crawling. He managed to hoist himself to a seat.

Toni was staring at him.

So was a fairly crowded Delicate Fresser.

A man in a cook's uniform was peering wide-eyed out of the back room of the place. I looked round, saw him, and said: "You make good coffee."

"Thanks," he said absently. He didn't take his eyes off the customer.

Toni was standing near the customer's table.

The customer looked up—very slowly—very, very slowly—and said:

"Hel. Lo. I. 'D. Like. My. U. Su. Al. Bowl. Of."

And stopped.

Quick-frozen.

Well, people are always trying to see if a convincing android is possible. For the most part, the work is secret—since a lot of places would love to get their hands on androids—Robbies that look and act thoroughly human—and pass them off on an unsuspecting public as Authentic Human Service, one way or another.

And a restaurant is one of the best places I can think of for final field-testing on a mech like that.

After a few minutes, of course, a man got up from a table across the room and took the quick-frozen Tough Customer away. He looked like a researcher, I suppose; at any rate, there wasn't anything else he could be.

After more than a few minutes, Toni came over and asked me what the Hell was going on, and I said: "Android."

She thought about it. "But what made him steal things? Just to show he could do it?"

"No," I said. "He was a tough customer. Really tough. And his—his owner didn't dare let people know how tough. So when he cracked something—tough plastic—or bent some metal tongs or a spoon, he had to take it away. Odd things are always happening in restaurants. Maybe nobody would notice. But it was less of a risk than leaving material around that had been cracked or bent or broken by a strength that really wasn't human."

Toni said: "Android? And—that convincing?"

"That convincing. And we can't stop it now. The job's just about done. Publicity would slow it down, but no more than that."

She sighed. "I'm going to lose this job to an android."

"No, you're not."

"But they work cheaper, they don't get tired, they won't make mistakes—"

"And they're not human," I said. "If I tell the owner I'll stop in here every time I'm on-planet—with a working field distorter—"

She smiled. A real smile, for the first

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time. "Knave, how can I ever thank you?"

I looked at her. A lovely figure, as I've said. Off-blonde hair. A big bright smile.

"We'll think of something," I said. "After all, I have a week before I have to report in."

The smile got broader. "Sure you wouldn't rather spend time with an android?"

I shrugged. "I'm a traditionalist," I said. "Authentic Human Service. Which reminds me—"

All over the place, customers were making impatient noises. Toni yelped.

"I've got to get back to work—"

"Fine," I said. "When you're off duty . . . well, that's then, Now, you can start with me." I thought. "Pastrami on rye. Coffee."

"And pickles?"

"Of course pickles," I said. "What else? And—oh, Hell, a Cheery Danish."

Toni stared. "You're sure, Knave?"

"Of course I'm sure," I said, and gave her a smile of my own. "Tradition." ■

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Greg Stec

BUILDING A BETTER BIOSPHERE

"Over there," she said. "That's where we are building the Biosphere."

I followed her gaze across a desert of brown hills and scruffy cactus roasting under an unrelenting sun set in a cloudless sky. Earthmovers groaned and rumbled through a curtain of dust hanging like fog over a two-acre site a short distance from where we stood.

"It's not much to look at now," she smiled. "But we're working on it."

Kathy Dyhr is a candidate Biospherean. She might be one of eight men and women who walk into the completed Biosphere-2 project shortly before the end of 1989. After the airlock closes behind them, they can expect to spend the next two years of their lives behind walls of glass and steel, away from the rest of the world. They will be the first to live in what many space colonists could call home one day.

Much of the challenge in space travel lies in discovering the ways and means of leaving our planet, (also known as "Earth" or Biosphere-1), to arrive safely elsewhere. It is certainly no simple task. Just as great a challenge arises when, once happily at a destination in space, humans must survive to explore new worlds and interact constructively with alien environments and resources.

"Survival" is the operative concept of Biosphere-2. Survival not only of humans in space, but also of plants, animals, water, air, and soil without which the human race could not exist. In this sense the multi-disciplined science of biospherics has under its aegis the protection annd propagation of Earth

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species threatened with extinction here, and the development of desolate regions, such as deserts and ice caps, that would otherwise be unsuitable for habitation.

Biosphere-2 will arch across the Arizona desert just north of Tucson. Inside there will be five distinct environments, or "biomes," modeled after Biosphere-1's large-scale ecology: rain forest, savanna, marsh, ocean, and desert. The 35-foot deep ocean will have its own wave-making system to support a coral reef and other life accustomed to the dynamics of the open sea.

The serious effort to build a Biosphere was conceived in 1984 as a privately-funded venture capital undertaking that will cost about $35 million by the time it is finished. That does not seem like an incredible amount of money when the object is to create a totally self-contained "mini-Earth." And this is, after all, a commercial operation from which Biosphere investors expect to get their money's worth in future marketing and development.

A big chunk of the Biosphere-2 investment money comes from Texas millionaire Ed Bass' group, Space Biospheres Ventures (SBV). SBV has enlisted a diverse group of specialists in high technology, physical sciences, and life sciences to build the Biosphere. Chief among these are Britain's Institute of Ecotechnics, the London architectural firm of Sarbid, Ltd., and the University of Arizona's Environmental Research Laboratory.

Bass is not simply a man with a lot of money who likes to indulge his fantasies, although he and his partners have favored the exotic in recent years. There was the hotel in Katmandu, the Victorian Gothic schoolhouse restoration in London, not to mention the Caravan of Dreams performing arts center in Fort Worth.

Joining this visionary investor are a number of farsighted scientists and architects like Margaret Augustine. She is the managing director of Sarbid, and project manager of Biosphere-2. There is also the director of the Environmental Research Laboratory, Carl Hodges. He has nurtured a bounty of concepts that stretch the imagination—from solar energy to aquaculture, to EPCOT center at Walt Disney World. One of his latest feats is an outdoor air-conditioning system for downtown Phoenix. Cooling off one of Earth's hottest cities should be qualification enough for joining the Biosphere-2 team.

The New York Botanical Garden Institute of Economic Botany is designing the rain forest biome. Research botanist Tony Burgess is working on the desert, and Dr. Peter Warshall is selecting species for the savanna. The Smithsonian Institution's Marine Systems Laboratory will handle the ocean and coral reef. Dr. Walter Adey is in charge. Some of his work is already on display at the National Museum of Natural History's "Living Coral Reef" exhibit.

Manmade biospheres are not especially new ideas. The Soviet Union has experimented with rudimentary biospheres in Siberia since the 1960s to test various long-distance space flight scenarios. Although the word "biosphere"

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has been used since the turn of the century to refer primarily to that area of the Earth where life abounds, it was the Soviet scientist V.I. Vernadsky who first spoke of self-contained life support systems like Biosphere-2.

The belief that biospheres can function on a large scale is founded on successful smaller experiments. Dr. Claire Folsome, one of the advisors on Biosphere-2, has had a closed ecosystem about one liter in volume thriving in her lab at the University of Hawaii for almost two decades. Biospheres that can support humans and their survival means for any length of time must be considerably bigger. Biosphere-2 will cover 98,000 square feet, with a volume of five million cubic feet.

A biosphere about the same size as a domed sports arena provides a number of opportunities to check what until now have been only hypotheses of environmental design and engineering. But according to Carl Hodges, there are a swarm of practical problems that have to be overcome on the way from the drawing board to the Biosphere.

"Starting from the skin out, it's very difficult just to seal something. A lot of work has gone into that. How to control the environment, which is basically open between different areas, and at the same time have them different, has been a challenge. How to have the rain forest be the rain forest?

"Selection of the food, having to look very carefully at each crop and produce it over and over again, and make sure you have the right crop and a balanced diet. How to clean the air? How to recycle the water? But there hasn't been any one thing that has stood out as 'Gee, if we can't solve that, we can't get it done.' Everything we've tackled, we see a way to make progress in solving the problems associated with it."

Even primitive man knew the Earth was not really flat. It might be flat underneath where it sat on the back of a giant turtle, or some such divinity, but it was obvious that the terrain around him had its ups and downs. The sky was above. The mountains stood below the sky. The mountains dropped down to the plains and savannas. The plains gave way to the seas and deserts.

It also came to the attention of the ancients that different kinds of plants and animals lived in the mountains than lived in the valleys and the seas. Our planet has supported millions of species for eons, in environments with wildly varying conditions of temperature, soil, and water. Biosphere-2's planners will not digress too far from the successful workings of Biosphere-1.

At ground level Biosphere-2 will not stand on a flat slab of concrete and steel. Rather, following Biosphere-1's successful model, it will rise and fall along a hillside. The gradient will create convection currents causing warm air to rise from the desert biome at the lowest end of the Biosphere. It will drift across the ocean and savanna biomes until reaching the rain forest biome at the highest level. The result will be condensation and precipitation: it will rain in the rain forest.

The pyramid-shaped rain forest biome is to be the largest of the five "wilder-

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ness'' environments. It will be about 80 feet high to accommodate the trees that will live there, and have 20,000 square feet of area. A stream will flow from a ''mountain'' in the middle of the rain forest. It will shoot over a waterfall, cross the forest floor, and flow through a transition biome before arriving in the savanna environment.

Further along, the stream spreads out into a fresh-water marsh, a salt-water marsh, and finally ends in Biosphere's ocean. It all sounds rather idyllic. And Biosphereans will indeed be able to camp, hike, swim, hunt, and fish through the biomes in their leisure time. But —sorry—no roasting marshmallows around the campfire. Burning is not allowed in this world.

Since Biosphere-2 will be totally self-contained, absolutely everything will be recycled: air, water, human and animal waste, plants. It is no wonder some of the most intensive work in planning Biosphere-2 revolves around recycling techniques. The air, for example, can get pretty stale inside a closed habitat, unless there are ways to purify it again and again. One method that could find use in the Biosphere is an outgrowth of work at the Environmental Research Laboratory. Gases like methane, carbon monoxide, and methyl mercaptan were pumped through soil in closed containers. Microbes in the dirt oxidized the gases, releasing water and carbon dioxide with no trace of the noxious fumes.

Temperature and air flow will also be crucial to the well-being of Biosphere-2 inhabitants. ''You have to let sunlight in,'' Hodges said. ''If we don't have a way of cooling the facility, the temperature gets very, very hot. It's like leaving the windows in your car rolled up in the summer. Biosphere-2 would heat up to over one hundred fifty degrees. So we have to provide an environmental control system that gives us the right air temperature.''

That system will probably be computer-controlled louvers across the glass canopies. They will open and close to regulate the amount of sunlight entering the Biosphere. Air inside Biosphere-2 will have to circulate more efficiently than convection alone allows. So fans will probably help the flow, and circulation around a cooling tower connected to the agricultural wing will provide even more temperature control.

Architectural design will also channel the air and assist in keeping the temperature inside Biosphere-2 comfortable for people, plants, animals, and computers.

As Hodges pointed out, sealing up the Biosphere is a top priority. He says ''Biosphere-2 will be sealed in the same standards almost as a nuclear reactor or an atomic submarine in terms of not permitting leakage in and out.''

When biospheres are erected in space, or on planets with thin or poisonous atmospheres, there is no question that nearly perfect seals will be essential. Several sealants are being tried, as well as O-rings and clamps. The exact method they settle on will probably be one of the industrial secrets Space Biosphere Ventures is hoping for.

Supplementing the seals and main-

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taining proper air pressure, the Biosphere will have a "lung" expanding and contracting with changing pressure. It will keep positive pressure on Biosphere's atmosphere so that, if leaks do occur, air will flow out and not in. The lung will expand as Biosphere-2's air warms, thus preventing the glass walls from blowing out under increased pressure. The lung itself will amount to a large diaphragm of pliant material with adjustable weight attached.

Stocking Biosphere-2 with the hundreds of animals and plants required amounts to an effort not unlike what Noah must have undergone filling his Ark. In some cases they must be purposefully collected in their natural habitats. This is especially true of land biomes, which are being assembled species by species.

Desert designer Burgess, for instance, models his biome after Biosphere-1's maritime deserts. Several desert regions meet his requirements, but the ideal one turns out to be the Vizcaíno desert in Mexico. It has a winter rainy season, and most of its plants are dormant in summer. So most of the desert biome species are being gathered in Mexico's Baja. The other land biomes follow a similar pattern.

"We have to take a selection of segments from these different environments," Hodges explained. "We're not going to take the whole Brazilian rain forest, but we're going to take a representative sample of the rain forest. Same thing is true with the ocean: it's a small ocean, but it's an ocean."

In fact designing Biosphere-2's ocean will be quite different from putting together the other biomes. Instead of selecting inhabitants species by species, Adey will likely scoop out chunks of living coral reef, mangrove swamp, and so forth to fashion the ocean environment. His reasoning is that too little is known about how hundreds of species interact in the ocean for man to pick and choose which will enter Biosphere-2.

There is naturally a lot of paperwork to contend with in gathering all this plant and animal life from around the world, something Noah did not have to deal with. Import permits are required of course, as well as additional permits for endangered species to be uprooted and carted to the Biosphere.

The people building Biosphere-2 are not out to merely mimic Biosphere-1. They hope to improve on it somewhat. Therefore certain harmful or deadly creatures will not be welcome inside their Biosphere. Nonetheless there will be plenty of variety, and Biosphereans will still have to share their quarters with some mosquitos, spiders, and snakes. Biosphere-2 is after all not supposed to be the Garden of Eden.

Its main goal is, however, the proliferation of life. But, ideal as the environments may be, life will not be permitted to run rampant throughout the biomes. Biosphereans will intervene where necessary. The tropical rain forest will not be allowed to shoot through the roof of its biome. The trees will be pruned. Plants and animals will not be free to dominate their environments to the detriment of other species. So the Biosphereans will have controlled hunt-

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ing and fishing expeditions that will limit animal populations, and weed out overly exhuberant denizens of plant colonies.

Over in the agricultural wing is where you would most likely find the people of the Biosphere engaged in daily bread-and-butter activities. This 20,000-square-foot biome will be where food and fiber crops grow on broad, sculpted terraces. Cattle and poultry will roam nearby. Setting up this area the right way will be basic to Biosphere-2's survival.

Future Biosphereans and support staff are currently working next to the Biosphere site in a greenhouse the same size that the agricultural wing will be when it is finished. For those not accustomed to seeing tropical fruit trees growing adjacent to cabbages and tomatoes, a first walk through can be somewhat disorienting. Yet the plants and their unlikely neighbors seem to be doing well with the horticultural techniques in use.

In one of the greenhouse tanks, tilapia, an African fish with a one-month propagation cycle, and a face only another tilapia could love, swim about looking fat and happy. They too have more than one role to play in the Biosphere-2 scheme of things. Aside from being quite tasty, they are part of the fertilization chain for food crops. Waste water from the fish tank goes to the hydroponic gardens where rows of lettuce, strawberries, onions, rice, watercress, and other edibles hang in nutrient baths. The water is then further purified by bacteria that converts ammonia in the water to nitrites for more plant nourishment, which goes to ferns, which are fed to the fish, and the process starts again.

Chemical pesticides are a prime no-no in Biosphere-2. In the Biosphere's closed environment, it would not take long for something sprayed on a plant to surface in a coffee cup. Project manager Augustine sees the Biosphere's work in integrated pest management as another commercially applicable outcome of the project. Ladybugs and lacewings by the thousands are being bred for pest control in the agricultural biome. Predatory beetles and wasps, fungi deadly to nematodes, and insect-repellant marigolds are all candidates to protect Biosphere-2's crops.

Plants and animals imported from other regions of Biosphere-1 will be quarantined before entering Biosphere-2. Naturally there is no way to completely sterilize each living thing coming to the Biosphere, and some unwanted guests will likely appear. This could be a serious problem if a pest multiplies and attacks an essential food crop. The best precaution at this point, in place of the forbidden chemical warfare, is a 60-foot glass tunnel between the agricultural biome and the others. Traditional technology will help deter invaders here as screen doors stand guard at intervals.

If the worst should happen and some plant species are hit hard by disease or insects, all is not lost. A biosphere functioning on another planet will not be able to send out for replacement specimens for the ones facing extinction. Likewise the people of Biosphere-2 will preserve their independent existence with replacement species from the Bio-

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sphere's cold storage locker. Researchers are building a library of plant cells, which, through micropropagation, will be on hand to fill niches left by plants that perish.

Say an unexpectedly virulent fungus wipes out Biosphere-2's strawberry population. Biosphereans can go to the tissue culture lab, select strawberry cells from a liquid nitrogen storage tank, thaw them, and introduce them to a culture medium where undifferentiated cells will be cultivated into complete plants.

Looking over the tissue culture lab prototype with prospective-Biospherean Dyhr, I saw racks of gleaming glass containers, each sheltering a tiny plant that might some day resurrect a lost crop in Biosphere-2 or save a rare desert bloom from extinction. How much tinkering did the Biosphereans plan to do in this lab?

"This is not genetic engineering," Dyhr said. "We won't be doing that in Biosphere-2."

Still, genetically-engineered species could certainly be useful in future biospheres. For one thing, size is a major consideration in the practical application of biospheres to space colonization. One potential client for Space Biospheres Ventures, the National Aeronautics and Space Administration, says it believes any type of extraterrestrial log cabin will have to be small, light, and energy-efficient. Species that are more compact and disease-resistant, yet capable of yielding as much or more food, fur, or fertilizer as bigger versions, will be highly prized in a biosphere's ecosystem.

The Biosphere-2 builders are rounding up as many pygmy animal species, or animals that do not take up much space in their largest forms, as they can find. Birds, snakes, turtles, frogs, deer, lizards, monkeys, and the odd agouti or two are being corralled.

Doubtless the most important residents of Biosphere-2 will be the eight men and women who will share life among the biomes for two years. Candidates work on different phases of the project in the preliminary stages as part of their training now. They are for the most part a young group, specialists in biology, computer technology, ecology, architecture, engineering, and farming. To say they are an eclectic group is an understatement. In a sense they are prototypical themselves, experts in overlapping fields as the ideal space colonists might be.

I asked project manager Augustine about the Biospherean selection process. She just shook her head and refused to talk about it. Top secret stuff. Suffice it to say they will be chosen from the larger group now shaping the Biosphere's components. For those who eventually live in Biosphere-2, life may not be particularly glamorous. There will be the daily grind of monitoring the Biosphere's air and water quality. Computers will assist, but a computer will not be able to milk a goat or pluck a chicken.

Biosphere-2's social structure will have a team leader making decisions and settling disputes that may arise, but life will definitely not be all drudgery and regimentation. There will be time for

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wandering in the wilderness biomes, tossing a line in the ocean, watching a movie on a VCR, or reading in the library. Each Biospherean will have his or her own apartment in a four-story structure which will be the "human habitat" area. Computer and communications facilities for Biosphere-2 will also be located here.

There should be a good deal of electronic contact between Biospheres One and Two through computers, radio, and telephones as the project staff outside collects information about what is going on inside. Augustine says there is already a significant support network operating for Biosphere-2.

"The biome design captains and consultants are currently in communication on computer networks across the country and in different parts of the globe. Those will continue as part of the operation. It is informationally open, so that creates a lot of dynamics in the system."

Biosphere-2 will not be a place to take the kids on your 1990 summer vacation. Space Biospheres Ventures is not yet ready to sell tickets to what some might think is the world's most exotic zoo. According to Augustine, "There will be a very limited amount of public viewing. The experiment will come first. But we will have documentaries filmed, and information will be released to the public at different periods of time."

The scientific community will have more access to watching how Biosphere-2 progresses. Since SBV's intention is to market biospheres and their spinoff technology, Biosphere-2 will clearly not be as isolated as a real Martian colony. In fact there is a conference center next to the Biosphere site with facilities for bringing the Bisophereans and their work to interested scientists and business people—electronically at least.

As for interacting among themselves, the eight Biosphereans will have only each other for human contact during the two years of the experiment. There are no set rules for behavior, the view being whatever goes on behind closed airlocks, on the Biosphereans' own time, is their own business. In practice, the potential for jealousy, anger, depression, and the whole spectrum of emotion will exist as it does in all human relationships. A Bisopherean could not allow individual whims to take precedent over the smooth functioning of the group. Survival in a space colony will demand maximum cooperation.

This is not to say that the parameters by which the Biosphereans, and indeed all the plants and animals of Biosphere-2, survive constitutes a very delicate balance between success and failure, life and death. Hodges and his team do not think so at least.

"One of the things that's exciting about Biosphere-2," he said, "is the self-regulating processes of life itself within Biosphere-2. Our job is to design the physical structure, the environmental control system, close enough that life can live and balance itself and evolve over time.

"We won't have to have it within a fraction of a degree or a fraction of a percentage of carbon dioxide, because

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the plants and animals in their own interaction will make the adjustments to make all that balance out."

What if, after Biosphere-2 starts up, something drastic happens which brings the experiment to a halt? The simple answer is that Biosphere-2 is designed for a life span of at least 100 years. They can start over again if need be—recycle the experiment.

But the people working on Biosphere-2 do not expect to fail. Perhaps they see their chances for success increased because they are pursuing more than one goal. Biospheres are meant not only for use as space colonies, but also as instruments for better living on Earth. Biosphere-2's air purification system could lead to cleaner cities where pollutants are pumped into the ground instead of the atmosphere. Deserts and otherwise depleted land could be reborn with life-giving water and enriched soil, planted with crops to end famine and disease. Endangered animals could be brought back from the brink of extinction, and rare plants could be propagated through techniques derived from biospherics.

If our worst ecological nightmares should come true some day, biospheres might ultimately mean survival not only for plants and animals, but for the human race as well. If depletion of the ozone layer, acid rain, nuclear war, or some completely unexpected twist in the planetary environment due to man or nature, threatens to make all or much of the Earth unhabitable, it would make more sense to find shelter in biospheres than to flee the planet in the hope of finding New Earth somewhere in the cosmos.

"It's a big challenge to design the environment of something as complex as Biosphere-2," Hodges told me. "But at the same time that challenge is teaching us a lot of things about how we do a better job of managing, or stewardship, or being involved with Biosphere-1. It's what we're sitting in right now. It's our life support system. These plants that we see around us are providing the oxygen for us to breathe, we're providing the carbon dioxide for them, and so on."

My last stop at the Biosphere-2 site was outside of the test biomes where some of the ideas for the budding Biosphere were being put through their paces on a small scale. The hot desert sun streamed down on leafy plants and trees growing within the tall glass and metal structure. A little stream flowed among the roots and soil. There were ripples in a shallow pool, and up near the canopy a mist had gathered. Inside it was starting to rain. ■

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Greg Stec is a freelance writer and a news editor at United Stations Radio Networks in New York, where his specialties are science and Soviet affairs. His reports have been broadcast on 500 affiliates nationwide, WOR radio, the BBC in the U.K., and Manhattan cable TV. His work has also been published in *New York Newsday*, the *New York Times*, and *The Communicator*.

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The Alternate View

CITIES AND TAXES

G. Harry Stine

An earlier column discussed cities and our modern images of them, pointing out that cities have evolved in size and complexity just as social institutions have. While thinking about the city as a centerpiece of human culture —"culture" stemming from agriculture and "civilization" being the art of living in cities; you can have the first without the second, but not vice versa—it also occurred to me that larger human organizations cannot exist without cities.

Nations and empires have depended upon cities. Where cities and their trading bases do not develop as a result of trade, or fall from grace because of changes in technology or politics, their nations and empires either do not evolve or fail.

Yes, there have been social institutions made up of large numbers of people who have not had great cities. Their rulers may have called these institutions "empires" or they may have been given the appellation "empire" by historians, but were these "pseudo-empires" merely a temporary collection of ruled peoples whose "imperial" designation disappeared upon the death of the "emperor"? True, some of these "pseudo-empires" managed to topple existing for real empires. The Persian Empire fell to Alexander's "empire" which in turn lasted only until Alexander of Macedon died, whereupon the Persian Empire reformed as the Seleucid Empire and finally assumed its ancient name; it lasted until the Muslims overran it. The "empire of the Huns" under Attila lasted only until Attila fortunately died, whereupon it fell apart under his numerous sons three years later.

But when the classical, for real empires fell, was it truly because of conquest from without? Or rot from within?

Or was it because of some other factor? Perhaps one due to cities?

I submit that an alternate view of the fall of empires should include the use or abuse of the cities that made the empire what it was.

Rome is an excellent example, primarily because we have reasonably good historical data about what happened.

The commonly-presented cause of the fall of the Roman Empire was the sack of the city of Rome by the Visigoths in 410 A.D. However, the capital of the Roman Empire at that time was not Rome but the city of Ravenna. . . .

The city of Rome was, throughout imperial history, never a trade center or a production center; it consumed the wealth of the Roman Empire—corn from Egypt, Sicily, and the Crimea; furs from Russia, and slaves from the barbarian borders everywhere, for example. The huge area of Gaul conquered by the profligate and debt-ridden rake and politician, Caius Julius Caesar, contributed nothing to the Roman Empire, a littoral Mediterranean empire, except a long, cold, and hard-to-defend frontier across central Europe over which the

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Germanic hordes eventually moved in strength in 406 A.D., under pressure from the Asiatic Huns moving westward. The Germans were finally forced to do what they had been capable of doing for centuries.

Gaul produced nothing that would help support the Roman Empire. It was instead an enormous drain on the Roman defense budget. Unlike the days of republican Rome when every citizen was a soldier, the Roman legions had come to be made up of professional legionaries, mostly Germans. Although the Roman legions boasted discipline, experience, and the capability to defeat several times their number of amateurs, they depended heavily upon being well-equipped with ever more expensive high-technology weaponry.

These weapons and the salaries of the paid professional legionaries cost money.

Where did the money come from?

Answer: Taxes.

Where is the easiest place to collect taxes? Certainly not in the countryside where peasants can hide themselves and the only items of wealth with which they can pay taxes: produce. And, once the tax collectors get their hands on the produce, they're faced with the task of getting it to a place where it can be made ready for market and sold: the cities. This is an expensive and time-consuming effort which raises the cost of collecting taxes which . . .

Tax collectors find it much easier to do their work in cities where merchants and traders are concentrated and where taxes can be collected in cash.

But cities require trade and must be protected and defended.

When the Roman frontiers ceased to expand in northwest Europe and were brought under pressure from the Germanic hordes without, defense costs for this region soared. More taxes were required in order to meet defense needs. As taxes cut into trade profits, trade began to dry up in the hot climate of taxation. People left the cities and thus the attention of the tax collectors. Thus, the cities of the western part of the Roman Empire dwindled in size. Trade then dwindled. The tax collectors began to work even harder. Taxes soared. This gave rise to a positive feedback system that worked as follows:

To escape the Roman tax collectors, the peasants put themselves under the protection of the largest of the local landowners; in short, they sold out. In return for title to the peasant's land, the landowner shielded the peasant from soaring taxes. This might seem like a hard bargain, surrendering a freehold to escape taxes, but this tells us something about the burden of taxation in those days. The freeholder voluntarily liquidated himself. The landholder, now involved in the day-to-day operations of his new holdings, left the city to reside on his new land in order to manage it better. This further depleted the city. And made things more difficult for the tax collector.

The new system developed in the Western Roman Empire was a prime example of the Law of Least Effort. Feudalism—which is what the new system grew into—was far cheaper for a peasant than supporting the Roman tax collector.

Furthermore, the landowner had to extend his protection to the military sphere because the declining spiral of

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reduced taxes had led to a reduced Roman military presence in the region. The peasants had thus bought themselves almost instantaneous defense rather than eventual protection from a Roman legion that might be garrisoned a hundred miles away.

The tax collectors thus caused the replacement of a system of law and money with a system of obligation and tithe.

This was perhaps one of the first examples of the relationship between cities and taxation: it's easier to gather taxes in cash in the cities than it is to chase scattered, uncooperative peasantry who have nothing to offer but produce which cannot be converted to money without exorbitant effort and waste.

The Eastern Roman Empire, on the other hand, was heavily urbanized and had been for many centuries. It had many cities located on major trade routes—Constantinople, Antioch, Salonika, and Alexandria being among them. The poor Western Roman Empire, unable to pay its own way, was heavily subsidized by the easier-to-collect taxes of the wealthy cities of the Eastern Roman Empire.

The Eastern Roman Empire was able to hold its defense costs within its ability to collect taxes; it did this by buying off invaders—primarily from the Persian Empire—and by hiring guards and mercenaries. From time to time, the Eastern Roman Empire experimented with forms of feudalism but the wealth of the Eastern Empire was sufficient to support its defense needs because of different terrain and different threats.

The Roman Empire was split and reorganized by Diocletian primarily because of defense requirements which were different for the eastern and western regions. A good general was the best emperor and, because the separate frontiers required separate commands, the Roman Empire was divided.

The Eastern Roman Empire was able to buy itself enough time to survive for a century until Justinian was able to rebuild the army under new lines at less cost. It then held on for another thousand years.

But Western Roman Empire, deprived of the support of the wealthier east, collapsed almost spontaneously.

It took a thousand years of wretchedness before western Europe collected enough wealth through the development of technology in its growing cities in northern Italy, cities that depended upon trade for their existence, as all cities do. The offspring of the Roman tax collectors were still there, but the budgetary requirements of a professional defense organization were smaller. There was no longer a need to keep the barbarians from the gates; the barbarians had become the inhabitants of the new cities, people who had learned the hard way over a millenium how to be civilized, how to live in cities.

Now, lest the reader believes this to be a diatribe against the tax collector, let's take an alternate view again.

China also had tax collectors. China was also exposed to invasion. But the Chinese beat back the hordes of nomads. The reproductive superiority of the agriculturalist overwhelmed the invaders. When the Huns and the Turks and the Mongols failed to conquer the Orient, they turned against Europe instead. The Chinese Empire was never really threatened in the same way as the

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Roman Empires. Although dynasties changed in China, the Chinese Empire thus endured for thousands of years . . . unchanged.

The result in China was stagnation accompanied by an occasional reshuffling of existing elements. There was no need to search for new truths to replace the old ones that no longer worked; the old ones were never challenged but were made to work in a patch-work fashion long after they should have been replaced with newer institutions.

The Orient developed many important technological inventions that were never reduced to practice because there was no motivation to do so; the old ways were perfectly good enough for an isolated culture.

Thus when the Orient came head-to-head with Europe a thousand years after the fall of the Western Roman Empire, there was no question that the evolved technical superiority of the European city dweller would dominate the confrontation even though China herself was the source of much of the technology that had been developed in the competitive hot-house of urbanized European civilization.

Theorem: When civilization collides with cultures, civilization always wins. This is because taxation is the mother of invention. The proof is left to the student as an exercise. And we're all students . . . ■

●George Santayana once told a friend that he had been glancing at some stories by Somerset Maugham, and that he couldn't understand their appeal. Why would anyone want to read about the kind of people Maugham wrote about?

Leaving aside the merits of Maugham, Santayana's question rests on a false assumption. Any fledgling critic could have told him a work of fiction stands or falls by the quality of the writing that has gone into it, not by its subject matter.

—John Gross

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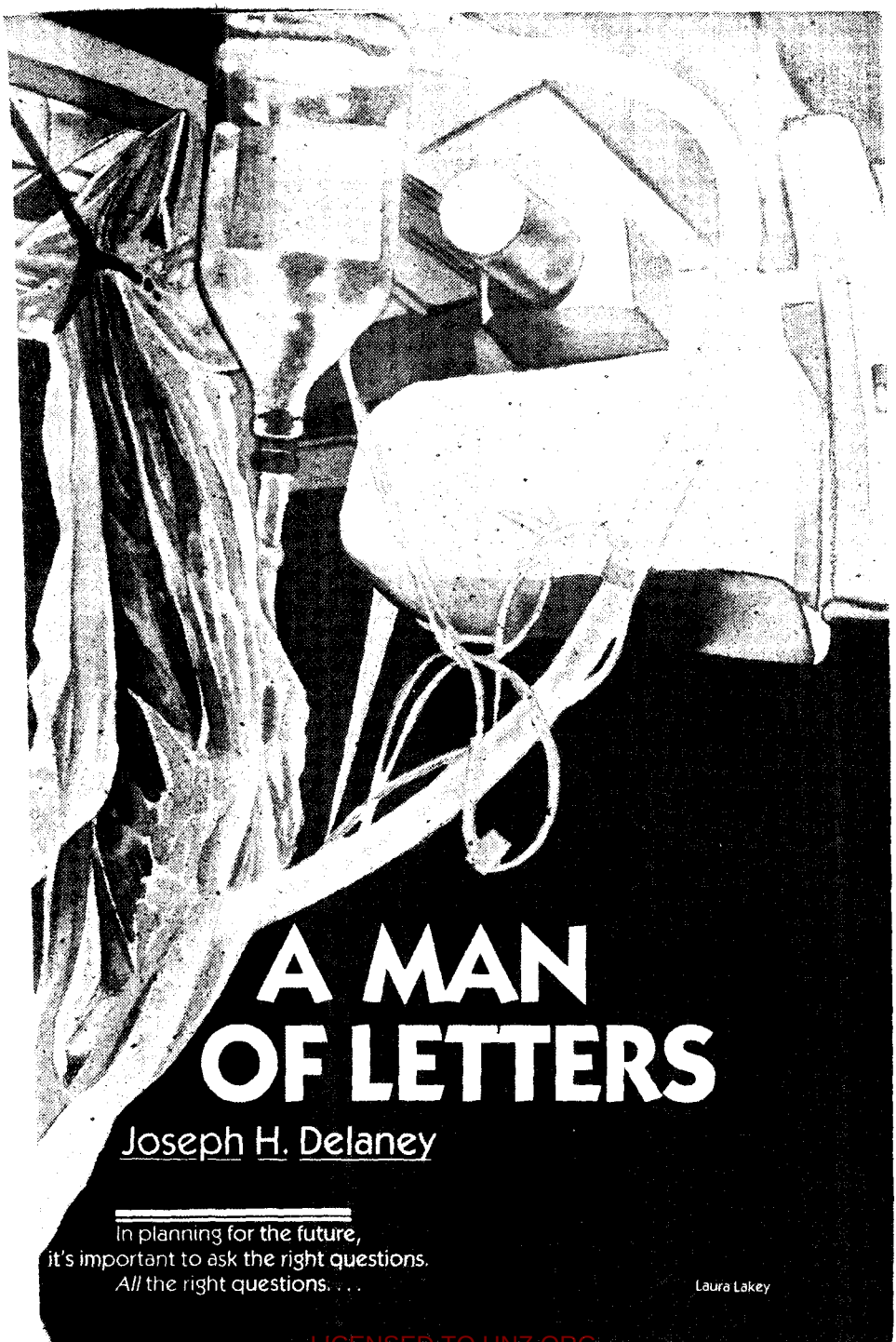

A MAN OF LETTERS

Joseph H. Delaney

In planning for the future,
it's important to ask the right questions.
All the right questions. . . .

Laura Lakey

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"You don't seem to understand, Hanson, I don't need your advice and I don't want it. What I want is the technology you've developed, and I'll get that, one way or another."

Dr. Kenneth Hanson was not a timid person, but against this onslaught he had shrunk back in his chair and stared in awe at old Rex Joser, whose hulking but infirm torso overhung his desk. "W-we have the world's finest facilities here, Mr. Joser, the best equipment, the most dedicated staff, the most brilliant researchers . . . "

"I don't want to hear that, Hanson. I'm one of the world's richest men. I can afford the best. I chose not to live among the common rabble. I will not mingle with them in death. I'm setting up my own facilities."

"I—it's not death, Mr. Joser . . . "

"Technically, perhaps not; who is to say? Nevertheless, cryonic preservation has perils I am not prepared to face, or at least not prepared to face without some acceptable measure of personal control."

"But you'll be . . . "

"I've endowed a foundation of my own, Hanson. The trust instrument will provide for rewards and for punishment of the trustees, and greed will take it from there. There is no room for sloppy sentimentality, and no need. The foundation will control essentially all my wealth, with every dollar devoted to my survival. I'm sure you understand what that could mean."

Hanson did. Rex Joser was a combination of Croesus and Rockefeller—he had inherited immense wealth and then utilized his own business genius to multiply that. What Joser wanted, he got, and though the Biostasis Foundation was presently the only game in town, he knew that if Joser wanted it he would eventually get it. All the present directorate could do was drag its feet.

But, that would not only be contrary to the foundation's purpose, which was to preserve life, but might destroy what they had already built. In the first instance, Joser might die during the litigation which was certain to ensue, in the second, the foundation's endowment might be dissipated by the cost. Better, Hanson concluded, to surrender some of what they had than lose it all. He was rapidly being converted to that viewpoint.

Hanson shrugged, straightened in his chair, tugged at his glasses and said, "I guess we could at least listen to your proposition."

A wicked smile washed across the old man's face, embedding itself in its lines. These seemed permanently etched in his flesh, as though he might have been born with them, fit to form smile or scowl, to save him the effort. "A wise decision," he replied with surprising calm.

He seems to be a perfectly reasonable person as long as you do what he wants. An associate had made that remark when Hanson's secretary called to announce he would be calling here.

"My purpose," Joser began, "is not to interfere with your operation, but to use your expertise to create my own. Neither will my people compete. After all, I have no need of any more money."

He paused, and his voice became gravelly, a symptom of something drastically wrong deep in his chest, something insidious and deadly. Still, a

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moment was all it took him to muster the strength to go on. "As I understand your process," he said, "you preserve the body by freezing, and you have some method of undoing the damage to the tissues which freezing causes." He gazed back at Hanson.

"Uh—that's not entirely correct—yet, Mr. Joser. Our present technology isn't that good. But—we're counting on improvements that will do it, on cell repair machines currently in the rudimentary stages of development. Freezing does no more than preserve the form from deterioration, so that when we do acquire the ability, we will be working from an absolutely reliable matrix. We can take our time, Mr. Joser. No one will be resurrected until we are absolutely certain we can correct the damage—and also, of course, cure the underlying affliction."

"Of course." This time Joser used the pause that followed, not only to clear his throat, but to rest.

From somewhere in a reserve of audacity he had not known he possessed Hanson summoned courage. "How long do they expect you to live, Mr. Joser?"

Joser's eyes told the story as he raised his head and gazed out at Hanson. He was more subdued now than at any time since his arrival. He was almost pathetic when he answered. "Not very long, whichever estimate you believe. Six months to a year. They have drugs they wanted to try, but these, I'm told, have side effects. They make a man *want* to die, but only occasionally do they cure. That wasn't good enough for me."

Again, he paused. "Well, don't you see, Hanson? I've got what every human being dreams of having, great wealth, and the power that goes with it." His voice wavered and he cast his gaze downward before he went on. "Then, along comes death, and takes it all away.

"I'm an exceptional person, Hanson, not just because I'm wealthy, but because I'm a shaker—a shaker who uses his wealth to get things done. The rest of humanity was born to mediocrity, and they're satisfied with that. When one of them dies the world never even notices. But some one like me—!

"When I was born Edison was still alive. So was Henry Ford, and Einstein, and Orville Wright and dozens more. Each of these men saw human culture and technology change radically in the span of his lifetime, but none of them experienced the absolutely awesome gulf my generation had to cross.

"When I was a child we had to learn arithmetic. Now, children use calculators. As a young man, I dictated correspondence to secretaries, who typed it on manual typewriters. Now, I dictate into a computer and my words travel electronically to their destination without ever touching paper. I used to read. Now, my household computer taps into the library and reads me to sleep. In place of my old Packard 120 I ride in a car with no driver, with greater comfort and safety than all my money could have bought the young me."

The old eyes began to glow. "It's exponential, Hanson," he gasped, now almost out of breath. "Now that it's gotten to you, your generation will never die—you've become too clever even for death—and I, I intend to bridge the gap and join you."

It was a while before Hanson took the

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cue and spoke. "You have essentially stated the situation, Mr. Joser. "Nanotechnology—this is what they're calling it: supersmall, superfine, superfast, superpowerful devices we can use to manipulate matter. We already have the understanding, the knowledge to do these things. We lack only the hardware. But, you're right, my generation will have it, and barring accidents, there isn't any reason why I or my contemporaries should ever die. As a matter of fact, the biggest problem we should have to tackle after that is how to keep the mediocre from breeding the Earth into starvation."

"Exactly," Joser gasped. "Now, I think you understand at last. We who are the backbone of the human race must be preserved at all cost. All others are expendable, we are not."

Hanson met this latest pause with a calmness and tranquility that belied his mood of bare moments ago. He understood Joser now, and understood his urgency. But that did not mean Joser was defanged. In whatever time he had left he could still do untold damage to Biostasis. But perhaps, though involvement seemed inevitable, it could be made to serve the Foundation's purpose. "What," he asked in a calm, friendly tone, "do you propose?"

Joser cleared his throat again, but failed to banish whatever it was that made his voice sound so harsh. "As you can see, I won't last much longer anyway, and I am in considerable pain all the time. I'll want to go under before it gets any worse, perhaps within days of now—if we can get the other details worked out."

"Uh-huh, I see," Hanson was nodding. He picked up a pencil and notepad, ornamental in this day and age, and poised to record Joser's words.

"You'll start me here, at your laboratory," Joser began, "while my own facilities are being built . . . "

"Why? Why do you need to do that? Ours will be more than adequate."

"I want to be sure, Hanson. My destiny must be under my complete control. I have lived a long time, Hanson. There have been catastrophes, natural and manmade. In my lifetime occurred the greatest, most savage, most deadly war man ever fought, and since that one there has been incessant strife on a smaller, slower scale. What I intend to build is a self-sufficient, indestructible, largely automated life-support system which can operate independently of the rest of the world—a nuclear powered system capable of producing the liquid nitrogen from reduction of the atmosphere—a system which has the intelligence to revive and cure me once that capability has been acquired."

"You're talking about a lot of money, Mr. Joser. You don't need to go that far. . . ."

"I want to." Joser paused again, not to clear his throat but to gather strength for his next utterance, the strongest ever, since his arrival, stronger even than those pugnacious remarks with which he had opened the interview. "There's something else I probably should have mentioned. This isn't just a scientific decision, Dr. Hanson. It has legal implications too. Have you ever heard of the 'rule against perpetuities'?"

Hanson shook his head.

"My lawyer explained it to me this way—it goes back to feudal England.

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The crown derived certain benefits from the succession of feudal estates. We moderns would call these 'taxes.' To avoid them, his subjects developed ingenious devices, among which were 'uses'—the modern 'trust,' reasoning that the use of something long enough was equivalent to ownership. The rule's purpose was to thwart this scheme. It said the estate had to vest, or terminate within twenty-one years after a life in being at the time of its creation had ended. Later, the rule was modified to allow for the period of a prospective heir's gestation—but, this is still the law today, and the modern sovereign vigorously enforces it.

"Thus, the IRS is standing by my deathbed waiting for me to kick the bucket, and because of estate and death taxes my estate, vast though it is, would become a dribble in the torrent that passes from the pockets of the people into the treasury—

"However, what if I don't die? What if instead I use my money to fund this project, and incidently insure my own immortality? Under those circumstances it cannot be argued that a taxable transfer occurred, since the principal was only temporarily entrusted to the foundation and will be revested when I revive. I am a life in being."

"All this is to avoid paying taxes?"

"Why not? In my situation these are confiscatory. I am without direct descendants, though that may someday change. The tax law of this country is designed to break up empires like mine—this is its purpose. But, if it can't do that to me, and my holdings remain intact while I am in suspension, to grow even larger than they are now, I will emerge even richer and more powerful than I am today. Think about that, Hanson."

"I-I am. T-they'll fight you, Mr. Joser. They won't let you get away with it, and maybe if we get involved it'll drag Biostasis down too. . . . "

"They may fight but they can't win—not if I'm processed while I'm still legally alive, and if your people certify that I've merely been suspended. Certainly, Congress will immediately plug the loophole, but that won't hurt either of us, now, will it?" The evil smile had at last returned.

"You know, I really am going to miss him," Hanson remarked with a sigh, to his assistant. "Uh—for a while, that is."

The assistant was new, one of many novice technicians who had been hired when Joser and the foundation made their deal. He did not reply. He looked down at the body of the old man that lay, sedated from an I.V. drip, packed in ice, and sustained at ever lower metabolic levels by the complex machinery in this cavernous room. Soon, when the temperature had dropped sufficiently, dry ice would replace the water ice. Ultimately, liquid nitrogen would be substituted for that.

Hanson stayed and supervised until he was certain nothing could go wrong with the operation and then he left, returning to the new and uncommonly plush office the foundation had given him.

The foundation was grateful. Joser's patronage had insured that Biostasis would be a commercial success. In his own style Joser had been generous.

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The old man's body would repose here for the time being, while his own private, automated crypt was being built on a nearby property he owned. Even before he was processed work on it had started, with Joser himself officiating, pressing the plunger on the detonator which blew out the first rock from the tunnel. Joser's monument to life was to equal those of other powerful historical figures. Within the mountain that was being hollowed out for him they would install a fission powerplant and reserve tanks of gas, enough so that if it were cut off from the normal world for a century Joser's body would still survive intact.

It was not contemplated that this would occur. Indeed, the thrust of the project was that there should be a constant improvement in the technology —this was the reason why the caverns were to be so large. At any given time a thousand dedicated researchers would be busy studying and updating what this facility contained.

They knew that within a decade the secret of reproducing the cells would be solved. That was the simplest problem of all. Harder still was altering those which natural processes had damaged before suspension began, because the technology of reproduction was initially expected only to copy what was already there.

But, Hanson thought, that would not be his concern. It would be the task of others, and he, as chairman of the directorate, had done his duty so long as old Joser's mortal remains escaped the corruption to which all his antecedents had fallen vicim.

Idly, sitting back in his new chair, which automatically adjusted itself to his body configuration, he spoke an order—"Computer?"

"Ready," the device responded, in a lilting feminine voice.

Hanson smiled. That had been his idea, and had cost a bundle, but he enjoyed it so much—it and all the other new comforts and conveniences Joser's generosity had provided. Joser, he thought, may have been extraordinarily capable and astute in business, but he was putty in the hands of the Foundation's lawyers, who understood the man's urgency and his reluctance to haggle over what to him were trivialities. When the choice was expend money or expend time, Joser's orders had been to choose the former and the Biostasis people knew it.

His directives would be followed, of course, followed to the letter—Hanson would see to that—and, he would himself emerge from this operation, and into his own immortality, as a comparatively wealthy man. For, he had asked himself, what use is immortality if it must be endured in poverty?

"Computer, get in touch with the broker who handles the Joser Life Foundation account. Engage them to represent me. I want all my present holdings liquidated and reinvested proportionately in the same securities Mr. Joser has."

"Acknowledged."

"Also, get in touch with the chief technician at the Joser facility. Tell him I'm worried about mechanical breakdown of Joser's tank. Tell him to duplicate the system—set up redundant systems."

"Acknowledged."

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"That's all, Computer. Go powder your nose or something."

"Yes, Sir."

Hanson flipped nervously out of his chair. He had reason to be excited. He'd just had the grandest brainstorm of his life, and there was absolutely no reason why he shouldn't get away with it with Joser frozen poker stiff and unable to interfere.

The odds favored an identical crisis in his own situation. Hanson was himself astute enough to realize that in the life of an immortal there would be not just one systemic failure but many. Once medicine learned to deal with the urbane—the cardiovascular failures, the carcinomas, the runaway endocrines and so forth—other exotic maladies would arise to replace them, and therefore these facilities might be needed again and again. He wanted to be ready, and to insure that when they were needed, they would be there—just as old Joser had done.

He didn't partcularly like the idea of lying helpless next to that ruthless old robber baron, but he could endure it in safety if he was careful in his own arrangments. And, since he had effective administrative control he would be the one who would judge when it was safe for Joser to be thawed and his cure undertaken. And that could be quite a spell, he mused, since thus far they didn't even have a reliable diagnosis. So, how could he justify thawing Joser if he didn't know what was killing him?

That decision of necessity, would be left to the ages—to progress, to the inexorable advance of science. As Joser himself had observed, the age of man had passed, along with that of the purely mechanical machine. The future belonged to the intelligent machine, over which man would merely rule. An immortal should be able to live out eternity without ever getting his hands dirty.

"W-who are you?" Joser's voice was feeble, and as gravelly as it had been when the needle had been inserted into the vein in his thin right arm. The ordeal had weakened him even further than his recollection of his last days of wakefulness suggested, but he knew this man—he was sure of it.

"How do you feel?"

Joser took stock. He really didn't know how he was. He hadn't had time to think about that. He looked around, gazing through eyes rheumy with both age and circumstance. He did not recognize any of the other people. There had been many spectators to his resurrection—strange people, with strange accouterments, clothing which looked rough and homemade, totally out of place in these precincts, where he expected to see the sterile, dull-green, pajama-type outfits proper doctors wore.

He reflected. Perhaps times had changed even more radically than he anticipated they might. He had no idea how long an interval had passed.

"I-I feel weak," he stammered. "Am I cured?"

The other man hesitated, while behind him the watchers grew bolder, and clustered near.

Joser could see faces much more distinctly now. These didn't even wear surgical masks. He took encouragement from that. It must mean there was no danger of contagion. But then he made another observation—they were none

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too clean and appeared to be armed—they carried daggers—and, they were all male. Joser couldn't conceive of a medical facility without women. Women had dominated medicine in his time.

Finally, his curiosity had grown too much. It excited that sensitivity in Joser which triggered both his indignation and the belligerant attitude which in men of great wealth constitutes the norm. "What is going on here? Who are all these people? Who are you?" He again demanded of the man with the familiar face.

"Mr. Joser! Mr. Joser, please listen—please try to understand . . . "

"I said, 'who are you?' "

"I—Hanson, Mr. Joser, I'm Dr. Hanson. I . . . "

Momentarily, Joser's voice regained composure, but his tone was still imperious. "Get these people out of here, Hanson, and help me up. I want to try out my new body."

"It's—it's not new, Mr. Joser." Hanson had in the meantime grasped Joser by the hand and pulled him into a sitting position on the padded table.

Vertigo intervened. Joser fought it off and in a more subdued tone he repeated all the unanswered questions, adding a new one—"why *haven't* I been cured? You're not supposed to revive me unless I *can* be cured."

"I didn't revive you, Mr. Joser. They did." He pointed to the greasy looking men who made up the crowd, who though they still clustered around, now carefully stayed beyond Joser's immediate reach. "They revived me, too."

"You disobeyed me? You didn't build my . . . "

"We did, and you're in it—and I was in it . . . "

"You?"

"All right, so I disobeyed you. If I hadn't you'd be alone with them. As it is, well, get ready for a shock, Mr. Joser, you aren't going to be cured. Neither am I. We're both dying, but if it's any consolation you'll outlive me."

Joser's mouth hung open, his lips slack, his expression incredulous. Then, after an instant of sober silence he gained a grip and roared, "I'm calling the police." He slid his thin buttocks off the edge of the table, gripping it with one hand, to steady himself, and tottered toward the distant doorway.

"Mr. Joser," Hanson called after him. "Mr. Joser—stop; these men are the police, or what passes for police nowadays."

The shock of that statement halted Joser in his tracks, but he had been at the end of his endurance anyway. This vast interval of time, and the ordeal his body had experienced, combined with low glucose levels, starved his muscles of the stamina he needed to remain erect, and he slowly wilted to the polished stone floor.

From the periphery of the chamber shadowy figures approached and with strong arms raised him and carried him back to the table, where they laid him out supine before retiring. He met Hanson's gaze with a bewildered look but the question that look begged was clear enough.

Hanson answered it. "We anticipated everything except what actually happened, Mr. Joser. We never counted on civilization collapsing, and it did."

For a moment Joser's expression did not change, then he spoke, "Nuclear war?"

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"No. No, that you planned for. Your installation would have withstood it, though slumbering inside, you and I might never have awakened until the powerplant's fuel was spent. The actual event was much more prosaic. You see, we asked ourselves the wrong question—the reverse of the one we should have asked: not 'what happens if this goes on,' but 'what if it doesn't?' "

"I-I don't understand."

"You—and myself and all the others, for that matter—assumed that civilization would not only sustain itself but would progress. We looked to the past and compared it with the present. We looked to the present and we extrapolated the future."

"We considered technical progress only, Mr. Joser, and we forgot about the sociological problems that an issue like immortality might generate." He gazed down at Joser.

"Those mediocre masses, Mr. Joser —they didn't understand, or understood only dimly, what we were attempting to do. They looked at us and saw us as the mediocre always see the competent, except in times of crisis—as pariahs, as enemies. They suspected we would become their masters, and that we would deny them immortality, simply because we abjured them to limit their reproduction to something the earth could handle. After all, we couldn't have immortals breeding for eternity."

"Then, it *was* acheived, Hanson. Hanson, if you built this place to my specifications, if you did as I told you it's still . . . "

"NO! NO, YOU DON'T UNDERSTAND!" The emphasis brought an end to Joser's protest but alarmed the armed men, who again clustered around.

He lowered his voice to conversational volume. "No, you see, it happened too soon, before we could do all the things we believed would be possible. We'd barely solved the problem of revitalizing frozen tissue—if we hadn't you really would be dead." He paused. "You soon will be anyway, though as I said, you'll outlive me. No, Mr. Joser, they didn't give us the time we needed."

Joser tried to rise, made it on the second attempt and looked Hanson in the eye. "Stop beating around the bush—tell me what happened."

"We made it too easy for them, Mr. Joser. Corn and circuses, just like the last time. Cradle to grave security and the tube with its endless professional sports spectaculars. We gave them these to pacify them, and at the same time removed the incentive to think."

He paused, and sighed, and cast his eyes away from Joser's steady, piercing gaze. "We gave them so much, thinking they'd be grateful, then tried to curtail the one thing they regarded as their birthright—the right to bring ever more mediocre ciphers into being. They revolted, and there being many of them and few of us, we lost the physical battle. . . . "

"You said there was no war. . . . "

"There wasn't. But there was a widespread civil insurrection during which they vandalized so much of the machinery of civilization that what remained wasn't adequate. Mr. Joser, you were under for almost a century and a half. I was out almost eighty years. Do you realize what can happen in eighty years?"

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Joser did. The expression on his face revealed that he did. "A whole generation . . . "

"We couldn't repair it. They'd destroyed too much. The system was so complex, so complicated—and so vast . . . Well, there just weren't enough educated people, not enough technicians who understood enough of the basic principles of the essential equipment to get it running again. Most of it had been designed by humans, of course, but then computers had taken over and refined it, and added innovations that men understood imperfectly if at all. And the computers were gone by then, destroyed by the mobs."

"But Hanson, there *are*—*were* libraries. All this knowledge surely was recorded *somewhere*. . . . "

"True. Now, Mr. Joser—now you're getting some insight into the situation—yes, it's true, civilization will rise again, over millenia, perhaps, as it did at least once before, and maybe the next time those in charge will be smarter than we were."

Joser's eyes gleamed. "Hanson, I built this place to last. If we can get rid of these brutes—if we can lock them out, if we can go back under, surely when responsible people take charge again, and develop cures . . . "

"I'm not finished, Mr. Joser. Mr. Joser, this may come as a shock, but even if I could put you back under to wait for that to happen I wouldn't do it."

"What?"

"I said I wouldn't do it. You're needed here—now, just like I was. I was awakened and rehabilitated by someone who had just enough knowledge to order the computer to start the process. I did what I could, but now I've reached the point where I could drop dead at any moment. At most, I have days. You have six valuable irreplacable months."

Joser's fury burst out, more in expression than in words. "There must still be some law here. I still have rights, and somehow I'll get to the responsible people and see that they're enforced. These so-called police . . . "

"*Are* the responsible people, Mr. Joser, not the mediocre masses. These are the movers and the shakers, and the reason they're here is to do what the mediocre masses can't: utilize you to rebuild civilization, to take up where I have to leave off."

"You idiot, Hanson; I'm a businessman, not a mechanic. I know how to make money, but I made it by ordering other men to make the things that we traded for money. . . . "

"It doesn't matter, Mr. Joser. You have the one skill these people need more desperately than any other —remember what you said about your childhood?"

Joser took his time to reflect. In terms of consciousness it hadn't been very long ago. He soon had it. "That children learned arithmetic then. That they learned how to use their heads . . . "

"They learned to *read*, Mr. Joser." He pointed at the huddling crowd near the doorway. "None of the men you see in this room can do that. They can't read because their parents couldn't read, because *their* parents killed the people who *could* read, and *their* parents destroyed the computers that had enabled them to get along without reading. While you

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were under the automated society progressed to the point where computer driven lifestyles had taken over the younger generation completely. Each one had his thumbprint recorded at birth—from then on all he had to do to get anything he wanted was stick his thumb up a reader slot.

"You can imagine what it was like when that was the norm. I don't have to—I lived it, I watched the breakdown begin. The first casualties were people on life support. The next were people who needed constant medical supervision the system couldn't give any longer. After that it was a progression, people with handicaps, people who lived in big cities and starved when food, power and transportation systems broke down. This is when I ducked out, and joined you, but I know a little bit of what happened after that because they told me." He pointed to the ragged crowd.

"They don't know what the present world population is, Mr. Joser. One thing is sure, though, there isn't any population problem anymore. Nature has culled the race. People with genetic defects have died like flies. You have to be fit to survive in their world."

Again, he pointed to the ragged crowd. "These—these, Mr. Joser, are the fit, the competent, the movers and the shakers. That little guy on the end—the one with the glasses made with mismatched lenses, that's Amos. He's the one who figured out how to revive me. Next to him is Wyatt, who's a sort of boss. Behind him is Franklin. Franklin has a memory like a sponge—he needs it, to carry the group's records, until they all learn how to read and write.

"That's your job, Mr. Joser. I started them on the road to literacy, but I'm dying. You said you'd last six months, and I hope you do, because that's just about what it should take to get them to the point where they can start deciphering such records as yet survive. With a little more luck, they'll get the machine cranked up again before the barbarian hordes arrive to burn and pillage and to destroy whatever's left."

"The barbarian hordes—no war, Hanson, you're one big contradiction. You said . . . "

"I said 'war didn't bring civilization down.' " Hanson glared defiantly, as though irritated at the interruption. "And it didn't, Mr. Joser. But It sure isn't going to give it any help getting up. We've always had the barbarians among us, Mr. Joser. Barbarism is the other face of man."

He paused, to give Joser a chance to reply.

Joser didn't.

"One more thing, Mr. Joser—you can still have your immortality."

"I can—but you said . . . "

"Not that way. Maybe there never was any chance that would have worked. I don't know, maybe under different circumstances. . . But there's another kind, the kind that went to people like the person who discovered fire, though we do not even know his name, or Homer's kind, or Mohammed's or Christ's or Buddha's or Kung's. Eternal life is no recent thing to human beings."

He started to move away, but got only a few steps before it became obvious he could not continue on his own. Then, figures approached, strong and resolute

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and reverent, and bore him up and away.

Joser never saw him again. He did not inquire what happened. He already knew. He felt the approach of his own day, measuring the length of its stride by the pain which wracked him. He steeled himself against this, and only when resolution could take him no further did he yield and let death come.

In time such written words as yet survived sprang again to life. In time, strong men, tiring of the ceaseless marching, brought their armies to a halt and listened to the wisdom of ages past. The nature of power changed subtly, flowing into different hands, moving from weapon to pen, from warrior to priest to scholar.

Presently, the nature of learning also changed. Again, as in the age of gold that men who had not lived in it remembered with such fondness, machines assumed the burden of drudgery and in their leisure men reposed and thought, what if—death need not be permanent? What if we . . . ?

It was then the ghost of Joser rose to haunt, though he had been dust for centuries, a herald of caution, to urge them, "wait—is what we have so bad? Eternal life is not a state of being—it is a state of mind. So long as any of you recalls my name, I will never die." ■

● Science is a first-rate piece of furniture for a man's upper chamber, if he has common sense on the ground floor.

Oliver Wendell Holmes

● Science, at bottom, is really anti-intellectual. It always distrusts pure reason, and demands the production of objective fact.

H. L. Mencken

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the reference library

By Tom Easton

Dreams of Flesh and Sand, W. T. Quick, Signet (NAL), $3.50, 301 pp.
Jack the Giant Killer, Charles de Lint, Ace, $16.95, x + 202 pp.
Elf Defense, Esther Friesner, Signet (NAL), $3.50, 224 pp.
The Shore of Women, Pamela Sargent, Bantam, $4.95, 471 pp.
The Best of Pamela Sargent, Martin H. Greenberg, ed., Academy Chicago, $15.95 (cloth), $5.95 (paper), xxxii + 322 pp.
The General's President, John Dalmas, Baen Books, $3.50, 384 pp.
Matters of Form, Scott Wheeler, DAW, $2.95, 240 pp.
Buffalo Gals and Other Animal Presences, Ursula K. LeGuin, Capra Press (P.O. Box 2068, Santa Barbara, CA 93120), $15.95, 196 pp.
The Valley So Low, Manly Wade Wellman, Doubleday, $12.95, xii + 212 pp.
Science Fiction: The 100 Best Novels, David Pringle, Carroll & Graf, $7.95, 224 pp.
Cosmic Joy and Local Pain: Musings of a Mystic Scientist, Harold J. Morowitz, Scribners, $18.95, 321 pp.

You know W. T. (Bill) Quick from his appearances in these pages. But you don't know **Dreams of Flesh and Sand.** His novel hasn't been excerpted or serialized, though it might well have been. It has that kind of relentless action. It also has the sort of attention to technological detail and novelty that you might expect of this old friend.

You say that's enough? You're going to rush right out and buy it, no matter what I say? So I can shut up and get on to another book?

Hey, I'm a reviewer. I've *got* to have my say. I've *got* to tell you this one backs up a little on the saga of cyberspace so many other writers have been developing to tell us how it might have come about in the first place. And then it takes the concept further than anyone else has yet dared to go.

The gimmick is that the man (Norton)

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who invented the "meat-matrix" (a computer supposedly built of chicken brain cells) and founded, with Nakamura, the huge Double-En corporation, has moved into the matrix. Now his partner wants him out, wants him dead, and to achieve that goal hires two whiz programmers specializing in developing and breaking computer security schemes. They are the IceBerg and his ex-wife, the Icebreaker.

As soon as these two sign on, someone starts shooting. Their employees wind up dead, their quarters are bombed, assassins pop out of the woodwork. A friend of the Icebreaker comes up with a way to interface her brain with the perceptual space of the matrices. And the explanation of the interface makes the kind of sense we haven't seen before. Quick thereby performs a valuable service, even though once we relabel the perceptual space of the matrices "cyberspace," we suddenly seem on familiar territory.

The rest of the story may seem fairly standard, if highly convoluted, intrigue culminating in a slam-bang finish. But it isn't standard. There are forces at work here—the Lunies and the mystic Lady, wolf-mistress, ruler of the Chicago underground—that leave Quick room for more than one surprise. And his final vision of sex in cyberspace, and its link to the Lady, raises intriguing possibilities. If he stays with this world for a sequel or two, he will be merging cyberpunk with modern urban fantasy (see the de Lint and Friesner reviews below), and taking the hybrid in a new and wild direction. Hop aboard for the ride.

There can be no doubt: Charles de Lint is one of Canada's modern masters of fantasy. He mixes the elements of Faery with the life of Ottowa's streets to grand and reader-pleasing effect. I enjoyed the last of his books *Yarrow*, and now I can say the same for **Jack the Giant Killer.**

The book is one of the last (I hear) of Ace's modern retellings of traditional fairy tales. Here, Jack is Jacky Rowan, and when her boyfriend walks out, she gets drunk, hacks off her long hair, and wanders the streets until she sees a strange little man in a red cap strangely slaughtered by apparent bikers. She retrieves the cap, dons it, and finds that it gives her the ability to see the giant standing in the park, the elves that sit in oaks, and the increasingly many things that go bump in the Ottawa night.

Soon she learns that the good elves are dwindling. The bad are thriving, and they seem about to swamp their ancient foes. When they do, their evil will no longer be confined to Faery. And the only way to prevent disaster is to rescue the princess, seize the Horn that rules the Wild Hunt, and use the Hunt to vanquish evil. Jacky identifies with the desperate elves (who, after all, belong to the Kinrowan clan) and accepts the mission. She is, it seems, not just Jacky Rowan, but "the Jack," avatar of heroes, and helpers draw to her side—her old friend, Kate Hazel (aka Kate Crackernuts), a fox-featured woodsman, a swan-winged prince, a wizard, a bard who may or may not be long dead. And she is on her way to the stronghold of evil, where princess and Horn await, and an ending that does an excellent job of defining "good."

I found this epic version of the old tale very satisfying. May you also.

Where de Lint is epic, Esther Friesner is mock-heroic, comic. But she too puts the stuff of fantasy on city streets, as she did in *New York by Knight*. Now she brings back two of that book's char-

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acters, Sandy and Lionel. They have moved to the wilds of Connecticut, to staid Godwin's Corners, a small town highly mindful of its colonial past. There Lionel, having been passed over for tenure at Columbia, teaches at a private boys' school. Sandy struggles with inertia as she tends house and daughter and prays for the nerve to open up a law practice.

The book's title, **Elf Defense,** gives you a clue to what happens. Yes, Sandy gets her shot at the law. In her stuffily mundane world, she finds Amanda, the runaway human concubine of the King of the Elves. With her are two boys, one her own by a mortal lover, the other a Prince of Elfhame Ultramar. When the King finds them and tries to reclaim what he considers his, Sandy steps in with all the force of the law. The King fights back with a plague of pixies and unicorns, which can be *very* embarrassing at both boys' schools and garden parties. Godwin's Corners gets its back up and copes, dadgum it! And in the end . . .

The reader smiles, chuckles, and, from time to time, howls out loud. Friesner amuses with the gentle fun she pokes at DAR-minded townsfolk, women's liberation, family life, and more. She tickles with the antics of Faery and impetuous lovers. And she ends it all with a soft smile and a hint of a potentially very charming sequel.

No, it's not great lit'rachur. It won't live for centuries. But then, that wasn't Friesner's intent. She wanted to entertain, and she succeeded admirably.

Pamela Sargent's aim seems to be something other. She wants to absorb the reader in the reading, and she succeeds, but she is not after laughs. She wants her readers to think along with her as she sets up a human problem and explores it with full attention to character and drama and verisimilitude. And her writerly skill is such that the reader may barely notice that Sargent's worlds are not those in which the reader lives, that Sargent is, in fact, a science fiction writer.

My case in point is Sargent's intensely allegorical **The Shore of Women.** She gives us a long-past-holocaust Earth, where women have expelled men from their cities, their havens of technology and culture and comfort, to live as the barbarians they are. (The resemblance to the world of *Venus of Dreams* is surely deliberate.) Men use each other for routine sexual relief and are conditioned to respond to the female form divine by manufactured dreams. When called, they journey to a city wall, where, unaware, they donate their seed to machines. The women of the city use their seed, via artificial insemination, to impregnate themselves. The resulting daughters they keep. The sons they hand back to their fathers. They debate doing away with men entirely; certainly, they do not allow men any chance of civilizing themselves.

This stage setting emphasizes the separation between men and women by reducing the manifestoes of the racial feminists to absurdity. Sargent now violates the separation in order to generate plot action, and story. A woman kills. Her daughter, Birana, stands by, silent. Both are exiled. The mother soon dies. The daughter survives and falls in with a band of men. At first she trades on the belief that the cities have fostered, that all women are aspects of the goddess, the Lady. She finds a male friend, Arvil. Male lusts begin to rouse. The city learns of her survival and orders her friend to kill her. He refuses, and they flee, eventually—unheard-of crime, perversion, folly—to become lovers

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and, perhaps, to demonstrate that men and women can indeed reach each other without power-trips or sex, and then to trigger change.

Their daughter will grow up in a city. Eventually—I think of Arvil and Birana traveling east before the birth, of the birth itself, in the stable-like women's hut of a tiny settlement where the few women are treated like cattle. Here is a Christ figure, subtly indicated but hinting that there may be a sequel in the works.

If you want more of Pamela Sargent, get Academy Chicago's **The Best of Pamela Sargent,** edited by Martin H. Greenberg. The book comes with two introductions, one a long and very complimentary essay by Michael Bishop, the other Sargent's own discussion of how she became a writer; together, they show us a powerful yet retiring voice, a woman who refuses to promote herself and is therefore neglected by critics, peers, and readers. She wishes her work to speak for itself, as indeed it does, but she has never won a Hugo or Nebula award. The fourteen stories are from *Twilight Zone, F&SF, Asimov's,* and such anthologies as *Orbit 20, Light Years and Dark,* and *Eros in Orbit.* All are excellent.

Why does she lack for awards? Is it that she does not promote herself, as Bishop says? That may play some part, but I suspect the lack is due more to the simple fact that she does not play to the grandstand. She is not a crowd-pleaser, given to blood and thunder and trite sentiment. She is a thoughtful, heartfelt writer who concentrates on what she has to say and on what art her material—not the market—demands. And her fellow writers, if not her readers, do recognize her value, for they had recommended her for the Nebula seventeen times by 1983. One of these days, and perhaps soon, she must gain the wider recognition she deserves.

At some point in their careers, many science fiction writers make the mistake of trying too explicitly to tell the world how to clean up its act. John Dalmas commits this sin with **The General's President.** It's the talkiest, dreariest excuse for a novel I have seen in ages. It has virtually no plot, no characterization, no villain except the status quo, and no hero except the author. Dalmas has done *much* better.

What's the problem? In the not too distant future, the U.S. is going down the tubes. The economy is shot, unemployment is high, terrorism is rampant, and so on. Worst of all, the president, who has just forced the resignation of the vice-president, is on the verge of a severe nervous breakdown. He asks General Cromwell to be the new VP; he will then resign to make the general president. But Cromwell says, "Hell, no!" The job scares him, and he wants two days to find a better choice.

He finds Arne Haugen, a Minnesota industrialist born in a hovel, bootstrapped to wealth, and loaded with independent, tough-minded common sense. Haugen accepts, and as soon as he moves into the White House he begins to make changes. He addresses the legal system, the IRS, education, medicine, always attacking the things Dalmas says are bringing the country down: greed and irresponsibility, the "gimmees." And every change, once Haugen has given Dalmas's lengthy speech on each problem and its causes, promises to work flawlessly. Haugen's opposition falls like dominoes as he sets up a new utopia for America and the world.

Call it the missionary syndrome. It has been said that SF is a religion. The

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field's writers are its priests, and many of them are full of grand ideas for the running of society. Not surprisingly, some of these priestly writers like to preach, though they may soft-pedal their sermons in favor of the hymns and collection plate. The problem may arise when no one realizes the sermons are there at all. Then frustration sets in and, once the frustration is fortified by enough grey hairs, the preaching grows evangelical.

Do you suspect that I disagree with Dalmas's prescriptions for social bliss? No so. I agree almost completely. But I see much better occasions for those prescriptions in lectures and magazine articles. Novels violate their own nature when they become hortatory pamphlets.

Scott Wheeler's first novel (I think) is not one to raise your hopes for his future. The ideas in **Matter of Form** are good enough, and the plot moves fairly well. But the plot moves as well as it does despite Wheeler's style, not because of it. Wheeler is, in the way of novice writers, excessively chatty, giving every little detail and then some. This serves him especially ill when he comes near the end and must rush like crazy to get his story told. The hastiness becomes most annoying when one alien character, already shuffled off into the distance, is restored without explanation to center stage.

The story: out among the stars, there are Good Guys and Bad Guys. The Bad Guys are the Ann Thaar, voracious predators that want to gobble up everything in sight. The Good Guys are the Shan, who like to run around studying other species. The trouble is, they are immortal, thanks to an engineered virus, and they have faster-than-light travel. Naturally enough, the Ann Thaar are after them, and when the villains come upon the Shan research team on Earth, the latter must flee for their lives. Unfortunately, their ship breaks down. They send a small team back to Earth in a lifeboat to guide the natives toward a technology that can repair the ship. The rest limp onward, hoping to find a refuge safe from the Ann Thaar.

Predictable stuff. Mediocre yard goods. If I had a rating system based on stars, I'd give this one a brown dwarf.

Some people loved Ursula LeGuin's last novel, *Always Coming Home*. Some hated it, calling it a self-indulgent non-novel and a betrayal of the SF tradition. I loved it, as a demonstration that there is more than one way to tell a story and as a lovely, lively proof that an invented culture can be as much a character in a story as any single person of flesh and blood. The time she spent fleshing out that character with snippets of folklore, anthropology, history, and custom seemed as justified, as and effective, as the time other writers spend telling their readers about the past traumas of their more human characters.

Yes, LeGuin was inventing a non-standard, sideways way of looking at a fictive world. And she hasn't quit, as she shows us in **Buffalo Gals and Other Animal Presences.** The title story tells of a small girl who survives the crash of a small plane and is rescued by a coyote. As in Indian legend, Coyote is a person, whose form flickers between that of the animal and the human. So too are Chickadee, Horse, Chipmunk, and the other creatures of the southwestern wild who make the child welcome. But they are not real in the modern, civilized sense. They occupy a Dreamtime set apart from the noisy, smoky, dangerous realm of humans, and eventually the child must re-

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turn home. Perhaps she has learned something by her sojourn in myth.

There is more: Stories—SF, fantasy, and fancy—powerfully stamped, like Sargent's novel, by allegory, but also by irony and inversion (Can a horse-happy teen become a horse? Read "Horse Camp."). Poems, stamped as powerfully by love of the Earth and keen perception. A delightful gift from a writer who knows how to create worlds as well as Hal Clement, if in a *very* different way. Don't miss it.

Karl Edward Wagner, Prince of Horror, has done us all a favor. There will be no more novels by the late Manly Wade Wellman, but thanks to Wagner we have one more book. It's **The Valley So Low,** a collection of almost two dozen of Wellman's stories from the last decade and a-half of his long career. They star Silver John, John Thunstone, Lee Cobbett, Hal Stryker, Judge Pursuivant, sophisticates and innocents of magic and evil, confronting, coping, winning. The language is that of Appalachian folklore, and the style is as benign and comfortable as anyone could wish. Buy it, or the Hide-Behind will get you.

Two years ago, David Pringle, editor of the British SF magazine *Interzone,* published **Science Fiction: The 100 Best Novels.** Now the book is available here, and while it may be difficult to review what amounts to a collection of book reviews, it is easy to mention it.

The book covers—with due thoughtfulness and opinionation—many of the classics, from Orwell's *Nineteen Eighty-Four* through Clarke's *Childhood's End* and Clement's *Mission of Gravity* to LeGuin's *Left Hand of Darkness,* Simak's *Way Station,* and Vonnegut's *Cat's Cradle*. To these it adds more recent titles: Budrys's *Michaelmas,* Wilhelm's *Juniper Time,* Gibson's *Neuromancer,* and more. And there is, of course—as is inevitable with any list—lots of room for argument. Consider it a guide for the novice fan, a spur for debate, a handy reference and memory tickler.

Harold J. Morowitz is a Yale biophysicist with a penchant for titles such as *Mayonnaise and the Origin of Life.* From this you might guess that he has a certain amount of wit, a somewhat cockeyed way of arranging truths, and a fairly effective way of expressing complex ideas.

You would be right. His latest book is **Cosmic Joy and Local Pain: Musings of a Mystic Scientist.** He wrote it when he was on sabbatical, mostly while sitting in a sailboat in a Hawaiian harbor, and his "musings" are introduced and punctuated by snippets of harbor life. The musings themselves are directed toward producing a unified view of the universe and of life's place in it. He summarizes the history of science, evolution, chemistry, and physics, sees that all is deeply interconnected, and finds irrefutable the conclusion that there is a grand design, "a plan or cosmic intelligence that somehow had us in mind, not likely as individuals but as part of the evolving world of thought, the noosphere."

I am not convinced. The interconnectedness is there, yes, and Morowitz is an excellent and often witty expositor of it. But that interconnectedness does not persuade me that there is a plan, or a planner. We are a product of the universe, and though we cannot help but see what led to us as being necessary and deliberate, chance, despite the rocks that Morowitz throws at the notion, seems quite adequate to account for all.

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I do not feel diminished by the thought that I am a cosmic accident—I am, indeed, frequently astounded by what rolling dice can accomplish.

It is worth reflecting on the need for popular expositions of scientific matters. Most people are ignorant not just of the methods of science, but also of much of its vocabulary. This means that any popular science writer must be exceedingly careful to keep the jargon to a minimum; Morowitz is often very good about this, though his writing speaks best to those who have at least a nodding acquaintance with the vocabulary. But then the writer must be downright paranoid about proofreading his or her galleys, for editors and proofreaders and typesetters are also ignorant. And Morowitz's were ignorant enough to serve him ill—I think in particular of page 208, where they have him talking about "the automatic weights of the isotopes."

ANADEMS

If Stan didn't have to put in so much time on this magazine, we might see more novels from his hand. He keeps working on them, but they come slowly, and we have to settle for whatever we get. Right now, that means a reissue of **Tweedlioop** (TOR Books, $3.95, 230 pp.), the tale of a small, shipwrecked alien who resembles nothing so much as a red squirrel. As I recall from reading the trade edition awhile ago, it's rather cute, which may make it best suited to younger readers. Little Tweedlioop has a certain amount of trouble making his plight understood, but he, the hikers who discover him, and the rest of the story's world all manage rather well.

Remember Harry Turtledove's sim stories? Right here, in *Analog*, he has been using the idea that when Europeans reached the Americas they found not more *Homo saps* but tribes of *Homo erectus*. And the sharp contrast between these sims and true humans promptly lead to the theory of evolution 200 years early, to abolition 60 years early, and—right on time—to the theft of research sims by animal rights activists. You will find it all in **A Different Flesh,** from Congdon & Weed ($16.95, ? pp.).

You say you don't remember anything about sims' rights? That's okay. The two stories centering on this issue never appeared in *Analog*, perhaps because they are less satisfying than the others. Buy the book for the good ones, for the author's cute touch of pastiching Pepys in "And So to Bed," for his subtlety of a title that, by cross-referencing Zenna Henderson's work, also on the basic issue of defining humanity, adds a little perspective to his argument.

And speaking of arguments, compare this one with Dalmas's book for an example of how to lecture without being obtrusive about it. Turtledove makes points as clearly but relies much more on acting them out. He lectures, yes, but less frequently and more briefly, and his didactic interludes seem to fit into the stories rather more neatly. ■

●The religion that is afraid of science dishonors God and commits suicide.

Ralph Waldo Emerson

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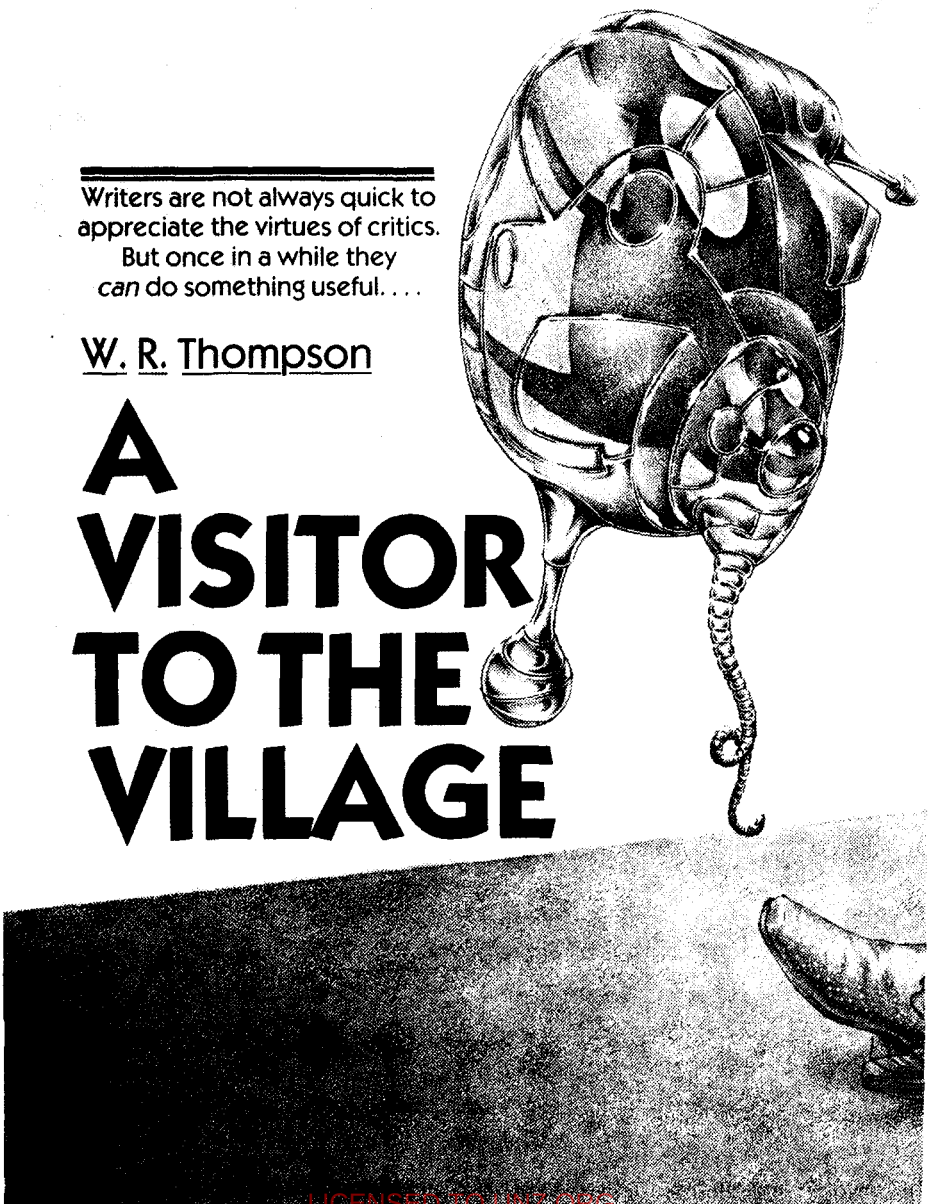
Writers are not always quick to appreciate the virtues of critics. But once in a while they *can* do something useful. . . .

W. R. Thompson

A VISITOR TO THE VILLAGE



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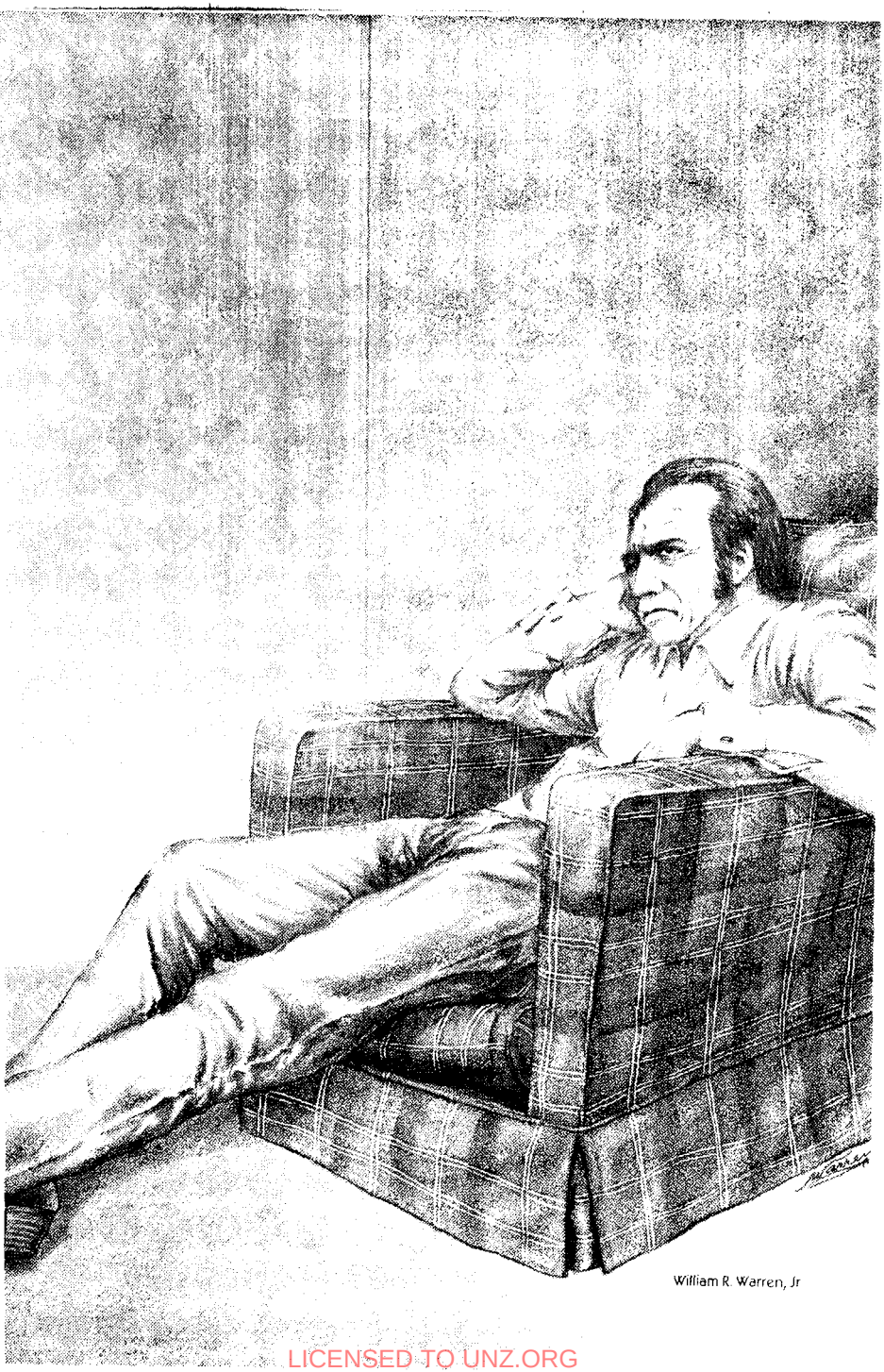

William R. Warren, Jr

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Greenwich Village sits at an angle to the rest of Manhattan, its streets intersecting the Avenue of the Americas, West Fourteenth Street, and one another at angles unknown to orthodox geometry. The traffic moves at a speed different from the rest of New York, the average number of pigeons per statue is off by ten percent, and the architecture is outré even by its own standards. In short, Greenwich Village looks like a ripple in the fabric of reality, a vortex of paradoxes and inverted probabilities, a victim of an especially nasty space-time distortion.

Greenwich Village may be all of these, but the blame cannot be placed on careless time travelers or misdirected timewarpers. The Village's peculiarities are natural, to use the term loosely. While any number of things could happen during a visit to pre-War New York, getting trapped in a cause-and-effect loop or vanishing into a parallel universe were still low probability events.

Ozhendu had always taken comfort from that knowledge. He liked to visit the Village, and not just because his psychology had been adjusted to enjoy it. The place was packed with important twentieth-century writers, turning it into a happy hunting ground for scholars of ancient literature. The fact that there would be no important twenty-first century writers (or much else in the way of twenty-first century humanity) added a certain poignancy to Ozhendu's studies.

At the moment he was on the track of James Barclay, noted for the soon-to-be-published *Through the Fire*. Ozhendu had spent the afternoon ferreting out Barclay's home address—a run-down walk-up on Christopher Street—and was now sitting on a bench across the street, waiting for the man to come out.

He spent the time reading some of Barclay's early works. They were technological fantasies and they were tough going for an aesthete, but here and there Ozhendu could see glimmers of Barclay's genius. He had a nice touch when he remembered to write about people, and the dialogue—when the characters were talking to one another, and not trading lectures—had a life of its own. That almost made up for the plodding, irrelevant science and hardware which too often eclipsed the story, and which no doubt explained why so few of Barclay's stories were remembered.

Ozhendu finished the last of the Barclays, and slipped the second-hand magazines and novels into his backpack. The time spent reading them had been far from wasted, he thought. The best way to get an author to talk about writing is to discuss his own work with him—failing that, ask him for an autograph. Either way, Ozhendu was prepared to draw Barclay out.

A man came out of a doorway across the street. "Barclay," his rec whispered from inside the pack. Ozhendu watched him walk down to the corner diner and go in. It had been hard to tell, but Ozhendu thought the man looked satisfied about something . . . as if, perhaps, he'd just finished writing a book.

That possibility filled Ozhendu with excitement. Temporal navigation was an inexact art, and no one knew the precise dates of the major events in Barclay's career. Catching him now, when

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he had just finished *Through the Fire*, was an incredible bit of luck.

Systems check, Ozhendu thought as he walked into the diner. Meeting a certified historical figure always made him edgy, and he covered that by testing his implants. The cybernetic voices were sensed rather than heard: *Shields nominal, probability perverter nominal, stunner nominal, memory decoupler nominal*—and most important of all—*temporal transfer system nominal.*

Barclay was sitting in a corner booth, eating something that had meat in it, not to mention raw vegetables that had grown in the dirt. Ozhendu approached him slowly, giving Barclay time to notice him and recognize the I've-seen-you-somewhere-before look on Ozhendu's face. "Aren't you James Barclay?"

"Yes."

"I thought so." The time traveler shrugged off his backpack and sat down. "Tim Ozhendu. I just read *Rimshot*. I thought it was great—the best thing I've read all year."

"Thanks." Barclay looked at Ozhendu. "I think I remember seeing you somewhere. Was it at Lunacon? Or Nasfic?"

"It might have been." I should have done some more background research, Ozhendu thought. He didn't know if Barclay was talking about places, events or hallucinations, and this was no time to play guessing games. "I wanted to ask if you planned to write a sequel to *Rimshot*."

Barclay made a snorting noise that might have been a laugh. "After I killed off half the characters in the book? Impossible."

Then he hasn't thought about writing *Rebound* yet, Ozhendu thought in satisfaction. According to several literary historians—including the insufferable Katistav, who had a knack for creating outrageous theories—Barclay had had the "inevitable" sequel in mind when he started writing *Rimshot*. Ozhendu decided this point merited a separate monograph, especially if it might help demolish Katistav.

Back to business, he thought. Memory decoupler or no memory decoupler, it was a poor idea to talk about an as-yet-unwritten sequel. "Mind if I ask what you're working on now?"

"I just finished a novel." Barclay nodded in the general direction of his apartment. "I'm sending it to my publisher tomorrow morning."

"What's it about?" Ozhendu asked.

"Gloom 'n' doom after they drop the Big One." When Ozhendu looked blank Barclay added, "Post-nuclear survival. Staying alive through the fallout and marauders and all that. After-the-bomb yarns are big this year and my editor wanted me to write one before the boom goes bust."

He must mean a publishing boom, Ozhendu thought. The writer couldn't possibly know that the real war would go "boom" in another five years. It was strange to hear a writer sound so cavalier about his work—then again, that might have been an aspect of a unique personality. "You think it's going to be a success?"

"I hope so, the way my rent keeps going up."

Ozhendu grunted. "I meant a literary success."

"I'm happy with it," Barclay said.

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"The plot is tight, the characters are sympathetic and the style is readable. What can I say? It's some of my best writing."

Ozhendu couldn't tell him that a lot of critics were going to agree with him. "Was it a lot of work?"

"The research was a pain." Barclay spoke around a mouthful of sandwich. "I had to wade through a lot of crapola. Survivalist junk about how easy it is to survive the Bomb. Anti-nuke propaganda about how we're all going to die. Tech literature about fallout and postwar scenarios, and you wouldn't *believe* how dull that is."

"Ah." Ozhendu's literary instincts made the next question inevitable. "I suppose your research gave you a lot of inspiration, though."

"Yeah, I came up with some good ideas, but the important thing was getting the background right." He finished his sandwich and picked up a glass of something brown and bubbly. "If you get the technical details wrong you can wreck your story. Even if no one notices the goofs, you'll have a lot of absurd things happening."

"I've always felt that way," Ozhendu said agreeably. Barclay's attention to detail, he knew, was one reason *Through the Fire* would be such a success. After the war had come and gone, the book's background details would help some of the survivors to hold on to life—and as they read, they would come to see that the story was even more important to their survival than the how-to accounts of fallout shelters and subsistence farming. The tale was destined to become one of the few sources of hope after the holocaust.

That was neither here nor there, Ozhendu told himself. "Tell me, when you do your research, do you look for material that resonates with a plot, or do you try to turn scientific and engineering theories into metaphors for human experiences?"

"No, mostly I look for nifty ideas. That lit crit stuff is all very nice, but I have to make a living." Barclay got up from the table. "Speaking of which, I have a manuscript to print out."

"Right." Ozhendu felt his mind churning. He'd come on too strong with the academic jargon. It might have been a precise and proper way of framing a question, but Barclay hadn't liked it, and that was going to cost him the interview—no, wait, there was still a chance to salvage things. "Mind if we talk while you do that?"

"I work alone—"

"I need a favor," Ozhendu said. "I'm taking an English lit class at NYU. The teacher doesn't like science fiction."

"Surprise, surprise."

"I found out when he saw me holding a copy of *Dune*," Ozhendu continued. "He reacted like Dracula seeing the True Cross. It's too late to drop the class, and there's no way I'm going to pass now—so I may as well have some fun."

Barclay looked dubious. "What do you have in mind?"

"A term paper about writing a science fiction novel," Ozhendu said promptly. "He'll have to read it before he flunks me, so maybe he'll learn something about literature." Which statement might also apply to Katistav, he mused.

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"You have an odd idea of 'fun,' " Barclay said. "Well, we can talk for a while. Come on."

"Thanks." Ozhendu congratulated himself while Barclay paid his tab. It wouldn't have mattered too much if this interview had collapsed. With the memory decoupler running full tilt, the whole thing would have faded from Barclay's mind after a few hours. Ozhendu could have started fresh tomorrow—but this way was better, he thought. Cooking up a quick story and making it work was like winning a game. He slid into his backpack as he followed Barclay out of the diner.

Distracted by self-satisfaction, Ozhendu didn't notice the mugger until the man was on top of him, his switchblade glinting in the streetlight. Ozhendu felt a jabbing pressure as the blade forced itself against his shield. He spun around and the man slid past him—and turned on Barclay. Damn! He had a quick vision of disaster—historical figure dies because a time traveler meddled with his life—before he thought to grab at the mugger's arm.

The mugger slipped, twisted, and dropped his knife. Barclay hesitated, surprised by the sight of a clumsy mugger, and then punched the man in the chest. The man fell, and Ozhendu kicked his knife. It went skittering into the street and Ozhendu struck a martial-arts stance, a pose of ritual aggression which his instructors had claimed would overawe any attacker.

The mugger was suitably impressed. He muttered a sexual absurdity—as a clone, Ozhendu lacked a mother to impregnate—then backed off in haste.

"Come on," Barclay said, taking Ozhendu by the arm. "He may not have had enough."

"Right." Shaken, Ozhendu let Barclay lead him to his flat. Uncertainty factors protected time travelers, burying minor changes in the quantum fluctuations which governed the universe. Unhappily, one of the uncertainties was the definition of minor. This slight change in the mugger's life (or in Barclay's life, or that of a witness) might cascade into a series of events that would disrupt history.

There was no telling what would happen then. Time travelers who created temporal shock waves and space-time singularities never returned to report their fate. Ozhendu had imagined a large number of potential disasters by the time Barclay had him sitting down in his flat.

"That's the first time that ever happened to me," Barclay said, as he put Ozhendu's pack on the floor. "Eight years in New York, and I've never even seen a mugging."

"Maybe you've been lucky," Ozhendu said. It was more than luck, he thought, although Barclay couldn't know that. The probability perverter had led the mugger to attack Ozhendu, even though the better-dressed, weaker-looking writer had made a more logical target. It had caused him to trip over his own feet and drop his knife as well. . . . all of which looked like a string of bad luck, not deliberate tampering. "Very lucky."

"Somehow I doubt it." Barclay locked the door and faced his guest. "All right. What *are* you?"

"I told you, I'm a student—"

"Who shimmers when he gets knifed. I saw it."

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Ozhendu suppressed a groan. Even in Greenwich Village, some things got *noticed*—but it might not be a problem. In fact, he reflected, Barclay might talk more freely if he knew the truth. After all, he *wrote* about time travel. "I'm a literary critic—"

"Horse hockey."

"—specializing in preWar novels." He gestured at the word processor on the corner table. "Like the one you just finished. *Through the Fire*. It was one of the finest works of this era."

"Umph." Barclay sat down heavily on the couch. "Then you're a time traveler?"

"I am. Let's see, you'll want some kind of proof—hah." Ozhendu opened his pack and took out the rec. He rubbed his chin thoughtfully as it floated in front of him. "How about watching a holo playback of the attack? Or—"

"That won't be necessary," Barclay said hoarsely. He stared at the recording unit, which spun slowly in the air. "Anti-gravity?"

"No, it's something to do with tachyons—"

"This is embarrassing," Barclay muttered. He looked at Ozhendu. "I just wrote an article about time travel. I proved it's impossible."

"We all make mistakes."

" 'Mistakes'! D'you know what time travel does to cause and effect? To logic?"

"It doesn't do anything if you're careful—" He paused while Barclay made a rude noise. "You know about the uncertainty principle? I think that's the contemporary phrase."

"Heisenberg," Barclay said. "It's impossible to know a particle's precise position and energy content."

"Good enough. There's a related law covering information. Small amounts of information can get lost, the way weak radio signals get washed out by static. The information gets ignored." Ozhendu wondered if his explanation was right. To get his traveler's license, he had taken a crash course in the principles of time travel—and had just barely passed.

"It's as if it vanishes down a black hole," Barclay suggested.

Ozhendu nodded, not because Barclay was right but because he wanted to stay on top of the situation. "Mathematically, changing the past requires the application of information . . . like telling you who'll win next year's elections, or doing something that will change your life. If the information doesn't interact with the world, then nothing can change."

Barclay looked appreciative. "That's a nice idea. . . . No. It doesn't wash. *I* know you're here—"

"But you won't remember." Ozhendu patted his midriff. "I have an implant here. A memory decoupler."

"You're going to wipe my memory?" Barclay sounded shocked.

"No!" The suggestion scandalized Ozhendu. "You think I'm some deviant? The decoupler makes you absentminded, nothing more."

"Oh, is *that* all?" His eyes narrowed to slits.

"That's all," Ozhendu said. He had forgotten that this was the sort of thing which upset primitives. They'd cheerfully scramble their minds with chemicals and bizarre cults and the Gods

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alone knew what else, but they'd throw a hissy at the thought of *planned* changes.

So speak his language, Ozhendu thought, talk like one of his characters. "You know that the brain has two ways of recording information, don't you?"

Barclay nodded slowly. "There's a short-term system that uses electric fields. Permanent memories are encoded into RNA."

Ozhendu nodded back. The science fiction writer was speaking off the cuff, but he was close enough to the truth. "The decoupler keeps your brain from putting information into permanent storage, so it fades out after a few hours. That happens all the time with unimportant information. The decoupler induces the effect."

"Suppressing memory-RNA transcription," Barclay murmured. "Interesting. What happens if I write a note to myself?"

"Implanted stun gun." Ozhendu leveled his thumb at the writer. "If you tried anything like *that*, I'd knock you out first. By the time you woke up, your memories of all this would have faded." He would stun Barclay at the end of the interview—it was a standard precaution—but there was no need to mention that. It might prompt Barclay to find a clever way to leave a message for his later self.

"I see—no." Barclay shook his head. "Why didn't you stun that mugger?"

"That—that never occurred to me," Ozhendu admitted. "I'm not one of you twentieth-century—types." He'd almost said *savages*. "I don't have your conditioned responses. Frankly, I'm not too certain how to respond to violence."

"That fits, but . . ." He looked worried. "Ozhendu, what if I'm scheduled to have a great idea tonight? If I forget an idea for a story I would have written—"

"You'll have the idea again, later." I hope, Ozhendu told himself. Barclay had hit upon one of the gray areas of time travel; in spite of all precautions this visit *could* change his life. "The idea would be latent in your mind. Theory says that information is conserved under these conditions."

"Barring uncertainties, no doubt." Barclay leaned back on the couch. "Your people seem to be big on information."

"That's why I'm here," Ozhendu said, deciding to get down to business. Barclay wasn't the one who was supposed to ask questions. "I want to collect information on you and your book. How you came to write it, how you arranged the plot, characterization—" He stopped and showed Barclay his most engaging smile. "And I promise not to talk academese."

"That's very big of you." Barclay sighed in surrender, although he looked far from unhappy. This was the ultimate flattery for a writer: to have a grateful posterity, in the form of Ozhendu, come to him and call him one of the greatest writers of all time. "All right, ask away."

"Well . . ." Where to begin? "Was your vision of nuclear war influenced by some event in your life?"

"No, it was influenced by the news. What in hell sort of question is that?"

Ozhendu raised an eyebrow. "Look, anyone who's read *Through the Fire* can see the passion in the book. Something profound happened to make you write

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the way you did. It marked a turning point in your career. The big question is, what happened?''

''I don't know,'' Barclay said. ''I told you, my editor wanted an after-the-bomb book. I just tried to show some likable people surviving under some nasty conditions.''

''But there must have been some upheaval in your life, something so traumatic . . .'' Ozhendu paused, tasting an idea. ''Something you might have blanked out.''

''A suppressed memory?'' Barclay laughed nervously. ''Maybe one of you time-trippers visited me when it happened.''

''I'd have to check the records.'' I hope that isn't it, Ozhendu thought. The more conservative critics looked down upon their time-traveling brethren, as if there was something uncouth about consulting writers on their work. If a traveler had interfered with the course of an author's career, reputations would shatter and critical theories—especially Ozhendu's—would fall into disgrace. The Machiavellis of the literary world would see to that.

''. . . just tried to write a good story,'' Barclay was saying. ''I don't know what else to tell you.''

Ozhendu felt irritated. Barclay may have been a great author, but discussing artistic concerns with him was like questioning a tone-deaf man about a symphony. It was as if he was a mere hack—no, of course not. His genius must reside in his subconscious, Ozhendu thought unhappily. That seemed the case, but it was hardly a discovery which would enhance his academic reputation. He would have to come up with something better than that if he didn't want to go home empty-handed—yes. He had an idea.

''You've already told me plenty,'' he told Barclay, ''But before I go I'd like to ask one more favor.''

''What?''

''Can I read the book?''

''You want—to—'' Barclay started laughing. He doubled over on the couch and began slapping his hand against the floor. ''Oh, lordy, lordy, you never read it! Now I *know* you're a critic!''

''I've read it,'' Ozhendu said stiffly, ''In translation *and* in the original. I'd like to see what you wrote before any editorial changes were made. Then I can discuss the changes with you, and get your feelings on them.''

''Sure, why not?'' Barclay sat up, wiping tears of laughter from his eyes, and went to his word processor. He switched it on and slipped a high-density floppy disk into the drive, and then rolled out the chair. ''Be my guest. Do you know how to run this?''

''I don't need to. Rec, autoscan.''

''Autoscanning,'' the unit answered politely. A faint glow stretched between it and the computer.

Barclay looked alarmed. ''That won't hurt the disk, will it? Or the computer?''

''A scan is a passive process,'' Ozhendu said. The opening paragraph of *Through the Fire* glowed on the monochrome screen. He read it, just for the sake of seeing *the* original copy on the very machine Barclay had used. Then, basking in the aura of art and creativity, sat down with his rec and started reading, savoring the book at a leisurely five thousands words a minute.

Something was wrong. At the end of

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the third chapter. Ozhendu stopped, blinked, and reread the material. He sped through the book then, a dull horror growing in him.

This book was not *Through the Fire*. The names were the same, the places, the events—yet it read like a parody of the book, a shallow, malicious parody. I changed the past, Ozhendu thought, I upset the flow of time, and this is where the disaster starts. He was afraid to imagine what would happen if he tried to return to his time. The whole fabric of reality might collapse.

Barclay was looking at him, unaware of Ozhendu's anguish. "What do you think?"

"This . . ." Ozhendu felt his fear transform into anger. "What in hell have you done? This isn't *Through the Fire*!"

"What do you mean? Of *course* it's—"

"It's garbage!" Ozhendu shrieked. He shoved the rec away as if it was hopelessly contaminated. "Crap! Kaka! Govno! It's an offense to anyone who can read without moving his lips!"

Barclay snorted. "I thought you said it was a classic—"

"This is classic catastrophe!" Ozhendu picked up his empty backpack, twisted it in his hands and threw it to the floor. "There's nothing in this —this—this *thing!* No love, no hope, *nothing!*"

Barclay jumped off the couch, his face burning with anger. "Listen, buster, there's all of that in there—"

"There isn't! Haven't you read this pile of warthog droppings you call a *story?* Your central characters, Mike and Ginny, have sex, not love. They don't even *like* one another, the way you've written it! And they may stay alive, but that's worlds away from surviving as civilized people!"

"What in hell are they supposed to do?" Barclay demanded. "Rebuild the world? Put the missiles back in the silos?"

"They're supposed to give one another a reason to survive!" Ozhendu stopped and swallowed. The shouting had made his throat sore. He forced himself to speak quietly. "Their families are dead, marauders are out to kill them, even Nature has turned against them. In spite of that they manage to behave *decently,* to find hope in the future. The whole theme of the story concerns the growth of their love—first for one another, then for the other survivors—"

"They help other people," Barclay said in irritation. "If you don't like the book the way it stands, *tough*. I don't need this lit crit jive about what the Muse should have murmured in my ear."

"The Muse!" Ozhendu said. "You don't need a Muse, Barclay, you need a Fury! You were supposed to have written something more than a mindless shoot-'em-up. People sat in fallout shelters and shacks, and read the story, and it gave them a reason to keep living. *That's* how powerful the real book is. *This* trash would make the living envy the dead!"

"Look, I'm just a writer, not some—"

Ozhendu stomped out of the apartment, his shield flaring as he shoved past Barclay and the door. He marched down Christopher Street, his mind churning. *This* was the hack that gen-

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erations of critics had lavished their praise upon. A word-mechanic. No wonder his attitude toward his own writing had sounded so shallow.

Maybe this is what happens when you upset the past, Ozhendu thought. The Universe turns vindictive, creating a parallel world designed to punish the offending traveler. In his case it was a world of schlock writers and schlock writing, a universe where all the literature turned to shit.

Ozhendu came to his senses quickly. If something had gone wrong with time, the results would have been spectacular—or too swift to notice. So nothing had happened after all. Barclay had an editor, someone who might have—no, who *must* have rewritten *Through the Fire*, turning it into a masterpiece. Yes. That would explain everything . . . and it put him in an excellent position. To be able to prove that Barclay was not fully responsible for his own work—now *that* would do wonders for Ozhendu's reputation.

He grunted. Semantic analysis had shown that *Through the Fire* was Barclay's work, and Barclay's alone. Not even the most skilled editor could have duplicated the man's writing style. No, there must be another explanation.

Ozhendu realized that he had been pacing back and forth in front of Barclay's apartment. That was the probability perverter's doing, no doubt, keeping him and the memory decoupler in range of Barclay—and out of the way of New York traffic.

I'll have to dig up his editor, Ozhendu thought as he returned to Barclay's apartment, and his agent. Maybe one of them had cracked the whip over Barclay, forced him to turn out a better book. Maybe. Right now, though, Ozhendu had to retrieve his rec.

It was still in the apartment, patiently floating by the door. Ozhendu got it and started looking for his paperpack. Then he noticed Barclay, sitting at his word processor, an ugly, unreadable look on his face. "What are you doing?" Ozhendu asked.

"What I always do with a bad story," Barclay said.

"Erasing it?" Ozhendu squeaked. Visions of catastrophe danced in his head.

"That's dumb, even for a critic." Barclay kept his eyes on the screen. "I want to rewrite this sucker."

" 'Rewrite . . .' "

"You heard me," Barclay said venomously. He turned the machine off and faced Ozhendu. "Although your magic memory eraser will make me forget about that, won't it? I won't remember that I want to make it better."

"Rewrite it?" Ozhendu muttered. I came back too early, he thought. I came back before he really finished the book—

"I was happy with it the way it was," Barclay said. "I was going to turn in the manuscript tomorrow—I suppose I will, too, unless you can shut off that eraser."

"Decoupler." Ozhendu shook his head. He felt the despairing fear that he had changed the past after all, in spite of—perhaps *because of*—all the precautions. "I can't. It's automatic."

"Swell. This is the first time a critic's ever done me any good, and I'm going to lose it."

"I haven't said anything about—"

Barclay silenced him with his glare.

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"I tried telling myself you were full of it—that you were trying to score points, maybe impress other critics or someone—hell, I don't know. Then I realized it didn't matter *why* you said what you did. The real problem was, you're right."

Ozhendu felt taken aback. "Well—I *do* understand artistic standards—"

"I don't mean that. What counts is that I can write better than *this*." He jerked a thumb at the word processor. "If I can write something as powerful, as *good* as you said I can, why should I settle for second best?"

"I don't know." I should leave now, Ozhendu thought. He was afraid to make the jump through time, though, afraid to discover what damage he had done to reality. "From what you said before," he said slowly, "I didn't think you took writing seriously, at least not seriously enough to try for something better."

"If I didn't, why would I listen to you now?"

Ozhendu hesitated. "To learn how to become a better writer."

"You can't teach me that," Barclay said. "What you've done is to show me where I've screwed up. I know I need that—but I'm going to lose it. The next time I sit down at the keyboard I won't remember any of this. You put me through this for *nothing*." He rose from his chair, rage on his face.

Ozhendu stunned him, then looked at his thumb in surprise. He had acted without thought, without hesitation. Something atavistic had entered his mind, he was sure of that. His meeting with the past had changed him, changed—

He tried not to think of that. Barclay sprawled on the floor, dead to the world. With a grunt Ozhendu hefted him onto the bed. As an afterthought he went to the refrigerator. Amid the clutter of dead (and some not-so-dead) plant and animal tissues he found a six-pack of beer. Ozhendu poured the beer down the sink and strewed the empty cans around Barclay's bed. Come tomorrow Barclay would have no questions about the hole in his memory.

Ozhendu squeezed his eyes shut. He made the jump through time then, an act which gave him an understanding of how a suicide feels when he pulls the trigger. There might not have been a future awaiting his return, he might have turned to random particles, existence itself might end—

"Welcome home." Ozhendu opened his eyes as the temporal supervisor pushed a relaxibar into his hands. The supervisor's matronly smile was as soothing as the bar's emanations, as comfortable as her office. "And how was the twentieth century?"

"Quaint." Ozhendu felt the dryness in his mouth and throat. Everything *looked* unchanged, and yet—"May I borrow your desk for a moment?"

"By all means." The supervisor turned her attention to her time machine, an antique which occupied most of a shelf.

Ozhendu leaned over her desk as he consulted the library terminal. Barclay and his career were still on record —*Rimshot, Through the Fire, Rebound* and all—unchanged, right down to the final notation that Barclay had died during the War. The cross-references re-

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mained the same as ever, directing him to studies on the importance and literary value of *Through the Fire*. The book itself, read at an almost panicked speed, remained *the* book.

Ozhendu picked up his rec and walked across the campus to his office. His twentieth-century costume drew some amused looks—why would anyone wear clothes on such a lovely day?—but Ozhendu was too distracted to notice the smiles.

What had happened? Barclay had been about to turn in the manuscript, and as pot boiling action-adventure tales went, it had been as good as it was shallow. He couldn't have remembered the conversation, couldn't even have written a note to his later self. What had caused him to change his mind? It was the sort of question that would give the temporal supervisor a headache.

The change must have been latent in him, Ozhendu thought. Whether dissatisfaction with his own work had brought on the transition, or whether the criticisms had somehow left its mark on his subconscious, Ozhendu couldn't say—*and didn't want to know*. His brush with upsetting the past had left him with a case of nerves.

It had left him with something else, he remembered: the first draft of *Through the Fire*. Comparing the texts would give him some insights into the process of creation. Of course, making the draft available to other scholars would stir up a controversy; Katistav and his tight little clique would—no. The only opinion Ozhendu had to think about was his own. He walked into his office, set his rec on the desk and fed its data into the terminal. . . .

. . . and found that Barclay had tried to use the rec.

The holographic display repeated everything in glowing miniature. After Ozhendu had stormed out of the apartment, Barclay had tried to leave a message to himself, an act thwarted by the probability perverter. All of his pens had run out of ink; pencils broke; the batteries died in his tape recorder and his computer developed glitches. Finally he slouched in his chair, his face dark and sullen.

After a long moment Barclay looked toward the rec. "Well?" he demanded. "Was he telling the truth? Can I really be as good a writer as he claims?"

The rec had quite properly refused to answer an unauthorized question. Barclay had gone back to brooding until Ozhendu returned to the apartment.

He might have asked the rec for a copy of *Through the Fire*, Ozhendu thought. He might have asked if he would survive the coming war. Instead he had asked the one question that mattered. Ozhendu felt proud to have met him. ■

● The great tragedy of science, the slaying of a beautiful theory by an ugly fact.

Thomas Henry Huxley

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a calendar of analog upcoming events

5-7 August
CONINE (Oxford area SF conference) at Oxford Polytechnic, Oxon. Guest of Honour—Terry Prachett. Registration—£9 attending, £4 supporting. Info: CONINE, c/o/ Ivan Towlson, New College, Oxford OX1 3BN, England, U.K.

5-7 August
OMACON 8 (Omaha area SF conference) at Holiday Inn Central, Omaha, Nebr. Info: Omacon 8, 2709 Everett, Lincoln NE 68502.

12-14 August
BABEL CON X (Grand Rapids area SF conference) at Airport Hilton, Grand Rapids, Mich. Registration—$12.00 and two S.A.S.E.s in advance; $18.00 at the door (or $9.00/day). Info: BabelCon X, c/o Steve Harrison, 1355 Cornell S.E., Grand Rapids MI 49506-4001.

12-14 August
CON-V (Oregon SF conference) at Sheraton Inn Airport, Portland, Ore. Guest of Honor—Chelsea Quinn Yarbro. Registration—$12 until 15 July, $15 at the door. Info: Con-V, Box 5703, Portland OR 97228. (503) 236-1366 or (503) 281-8183.

12-14 August
TORONTO TREK CELEBRATION 2 (Star Trek literary-oriented conference) at Ramada 400/401, Toronto, Ont. Guests of Honour—Diane Duane and Peter Morwood, Fan Guest of Honour—Shirley Maiewski. Registration C$20 until 30 June, C$25 at the door (all cheques payable to Carole Mallett). Info: Toronto Trek Celebration, Box 21, Station O, Toronto, Ontario M4A 2MB, CANADA.

19-21 August
WINCON/UNICON 9 (Peripathetic university-based SF conference) at King Alfred's College, Winchester. Guests—Patrick Tilley, Michael De Larrabeiti. Registration—£8/$12 attending, £4/$6 supporting. Info: WINCON, 11 Rutland Street, Hanley, Stoke-on-Trent, Staffs. ST1 5JG, England, U.K.

26-28 August
BUBONICON 20 (Albuquerque area SF conference) at Albuquerque, N.M. Guest of Honor—John E. Stith. Info: Bubonicon 20, Box 37257, Albuquerque NM 87176.

1-5 September 1988
NOLACON II (46th World Science Fiction Convention) at Sheraton Hotel & Towers, Marriott Hotel, Rivergate Convention Center, New Orleans, La. Guest of Honor—Donald A. Wollheim, Fan Guest of Honor—Roger Sims TM—Mike Resnick. Registration—$70 to 10 July, $100.00 at the door, Supporting—$30. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer. Info: Nolacon II, 921 Canal Street #831, New Orleans LA 70112 (504) 525-6008.

—Anthony Lewis

Items for the Calendar should be sent to the Editorial Offices six months in advance of the event.

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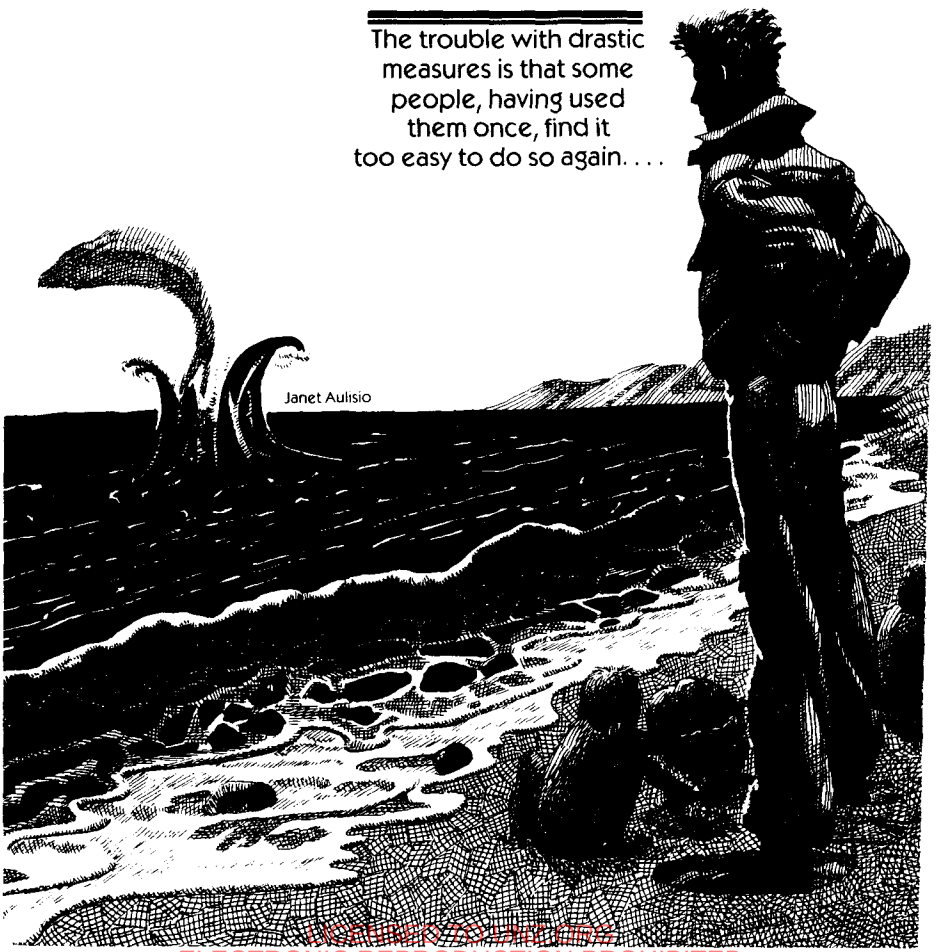
LONG SONG

J. Brian Clarke

The trouble with drastic measures is that some people, having used them once, find it too easy to do so again. . . .



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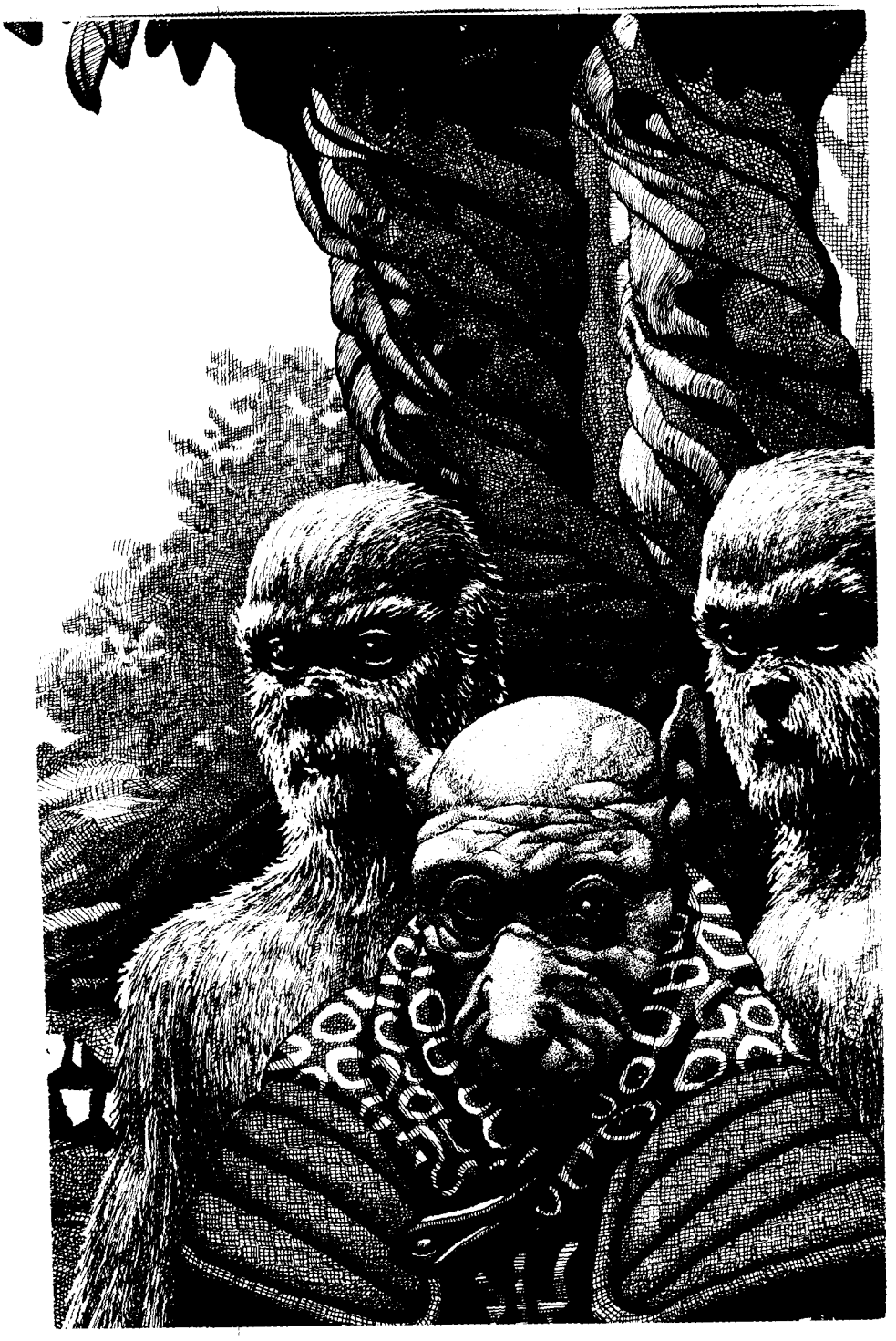

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'My flying eyes have seen new creatures on the land.'

'I, too, have seen. Yet we both know that is an impossibility.'

'Perhaps not. I think they are from elsewhere.'

'Elsewhere? There is no elsewhere.'

'There is if it is beyond the sky. I saw a metal fish come down from that direction. I also saw some of the creatures emerge through an opening which appeared in the side of the fish.'

'Ah. When I observed, all I saw were many hundreds of the metal fish already clustered on the ground. I thought they were birth shells which the creatures had discarded. But from what you have described, I must now assume they are conveyances.'

'That is a remarkable assumption.'

'It is a natural assumption made from known facts. Perhaps, after all, there is something to the ancient legend which describes the points in the sky as worlds. If that is true, then we must accept the possibility that the creatures are from one of those worlds, and that they were transported here in the conveyances they constructed for that purpose.'

'Friend, that implies the creatures are intelligent. Is it therefore possible the ancient dream of our species is at last about to become reality?'

'I believe that is one question we should not ask, at least not yet. When wishes are strong, it is tempting to endow such wishes with a reality which may not exist. And we all know the heartbreak of the truth which inevitably follows.'

'Then what must we do?'

'Above all we must not abandon that which we have already started. Although the experiments have been in place for many generations and do not yet show promise, still it is too soon to be certain of failure. Meanwhile, we must breed additional flying eyes so that we can observe the new creatures more closely.'

'Agreed. And then we hope.'

'Oh yes. Always, we must hope.'

At the time Emma's message was received at Project Alchemy, Gia Mayland and Jase Kurber had already departed for a long sabbatical on Serendipity. Theoretically they could have been recalled, indeed perhaps should have been. But Davakinapwottapellazanzis felt that what humans oddly referred to as "burnout" was too much of a risk for his friends. So instead the old Phuili asked Kel Bannion and Silskin to meet him in his personal quarters.

Silskin was the first to arrive. Gray furred, humanoid and graceful, the Silver bared his fangs in a friendly greeting, "David, I smelled urgency in your summons. Have they found another ark?"

Silskin, his sisters, and the few young Silvers who had been smuggled away from the world called Colony, were the reason for Project Alchemy. The project was the antidote to the virulent disease of anti-life, which was the unholy purpose bred into the minds of hundreds of thousands of fanatical Silvers who were drifting at sublight toward assigned targets among the stars. To vaporize each converted asteroid or "ark" as soon as it was found, seemed a legitimate countermeasure. But because genocide is as psychologically debilitating to its perpetrators as it is physi-

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cally destructive to its victims, young Silvers—weaned away from their destructive instincts—were being trained by Alchemy as peace ambassadors. So far the score was even. One ark had been destroyed along with the thousands aboard her. But the crew from a second ark, forced to abandon most of their food synthesizers as their gigantic craft plunged into a sun, were painfully rediscovering the ancient necessity of life-originated protein.

"No. Zey have not found anozer ark." A short and stocky humanoid with wise eyes, David twitched his canine-like muzzle with the Phuili equivalent of a smile. "I zink arks can wait short time."

The door opened and Kel Bannion came in. An experienced agent of Expediters who had been assigned to Alchemy because of his previous background as an educator, the lanky human was liked by his mischievous students despite his dour rare-to-smile exterior. "Inside that man is a child struggling to get out," Gia Mayland had shrewdly observed soon after Bannion arrived at the project. It was obvious the young Silvers were no more fooled by Bannion's glum demeanor than Gia had been. "I hope this will not take long," the man said, "I am scheduled to take a couple of the juniors on a field trip."

"Zat can wait," the Phuili said. "We go to Colony."

"Colony?" The enormous pupils of Silskin's eyes slitted with concern. "My sister—"

"Emma iss well. We go because of weport zat native intelligent life form may conflict wiz settlements of Silver People."

Bannion shook his head. "Not possible."

"You know somezing I not know?" David queried with gentle sarcasm.

"I do know that the only indigenous animals which have been observed to show even the least sign of intelligence, are the local equivalent of whales. David, there is no way creatures in an ocean can affect what goes on on the dry land—which in Colony's case is about as lush as northern Siberia!"

It was a fair comparison. Colony was still in the grip of an ice age, with huge ice caps extending to mid-latitudes. There was a single large continent on which life clung in the form of savannas and subarctic forests. The three Silver settlements were almost on the equator, spaced equidistantly apart on a tableland just south of an enormous river delta. The climate, although severe by most acceptable standards, was the mildest on the planet. Agriculture was still primitive, and would probably remain so until the people could fully accustom themselves to the annual disciplines of cultivation, planting, and harvest. But the synthesizers they had been able to rip out of their doomed ark were rugged machines, and still supplied nearly half of their nutritional needs. The remainder came from the scrubby fields, and occasionally from the lush water-plants of the delta. It was rumored some daring individuals were supplementing their diet with animal protein from the swimming creatures which were plentiful in the delta. But if it was true, the behavior was an aberration rather than a necessity.

Most of the nearly two thousand who

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died during the first two winters had been the older ones; those who could not adjust to the ultimate obscenity of sustenance based on living matter. They had heard the rationalization; that to continue the holy sterilization of the galaxy they would have to build a new ark to replace the one destroyed in the fires of this system's sun, and that they could not even start the construction unless they were prepared to "use" the planet's life infestation instead of destroying it. Now, six years later, with the population stabilized at around seven thousand, what had once been unthinkable was now merely unpleasant.

Berein was a lesser, one of those unlucky ones who could only communicate with voice and hearing. Nevertheless the other Silvers treated her with respect, even to the extent of accepting that her obvious intelligence was a natural compensation for the unfortunate deficiency of nerve endings which denied her the warmth and absolute honesty of hand-to-hand "secret talk." They also accepted as natural her solitary lifestyle and occasional absences.

So Berein's presence in a valley eighty kilometers inland from the throat of the delta was not unremarkable. Neither was the child in her arms, because it would not be missed. The practice of abandoning unwanted babies was a sad one, but it had already provided several recruits for Alchemy. Including one of Berein's own.

The pinnace hissed out of a low bank of cloud and landed a few meters from Berein. She walked toward the machine, then with a glad cry began to run as the stocky figure of Davakinapwottapellazanzis emerged, followed by her brother Silskin. With her free arm she hugged the old Phuili. Silskin impulsively grasped her hand, then dropped it again at the deadness of the contact. "Sorry," he said, in his embarrassment remembering how she had voluntarily accepted nerve blocks so that she could not betray her undercover role via the wide open two-way of secret-talk. "I keep forgetting."

Tenderly, Berein touched his face. "I have learned to live with it," she told him simply.

David took the child from her. The tiny body was thin and wasted. Breathing was shallow. "Much wong wiz zis one?" he asked.

Berein shrugged. "The usual. Lack of proper care during pregnancy, parents too tired or too unwilling to accept the baby after it was born." She brightened. "But I think we have turned the corner. Last week in Settlement Two, one of the females gave birth to a litter of five. And only one died!"

Several humans emerged from the pinnace and began to stack cases on the damp ground. David handed the child to one of the humans. "Pleese make zis young one comfortable for weturn to ship," he instructed. He turned back to his former student as she asked, "How is little Emma?"

"She best of smallest ones," David replied solemnly. "She also Gia's favorwite. But now you answer me question. What means 'turn corner'?"

"It means we are now beyond the point of mere survival," Berein explained. "Work has even started on the distillation plant! Within a year, the engineers think they will have enough re-

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action fluid to start launching scout missions to the asteroid zone."

That startled Silskin. "To create a new ark? But it's too soon—"

One of the humans came over and put an arm about the male Silver's shoulders. "Come on Silskin," he said seriously. "Have you already forgotten the exercise of rational thought? Even if they can put up enough scouts to coax one of those rocks into Colony orbit, how long do you think it will be before they have the industrial capacity to build and install drives and life stasis equipment?"

Silskin sinuously slid from the human's grasp. "Meet Kel Bannion," he told his sister. "This human is in charge of my continuing education. I like him but sometimes he aggravates me."

Bannion ignored the jibe. He said to Berein, "Ever since Gia Mayland waxed so eloquent about her Emma, I have wanted to meet you." Suddenly, a rare smile. "You are truly an Alchemy success."

"I am Berein now. The name of Emma has been given to my child."

The human inclined his head. "I have worked with that one. You have a right to be proud of her."

Already a bubble hut was being erected. Other humans were assembling the components of a compact heliflyer. David led Bannion and the two Silvers apart from the activity. "For long time we have suspicion of intelligent life," the old Phuili said. "But evidence not sure. Now anozer weport fwom Bewein. Yet still not sure."

Bannion frowned. "I can understand uncertainty when such reports are from only one source. But now that you have Berein's confirmation—"

David shook his head. "Still confusing. First source iss one we all know; weported soon after Silver People come here. Human team found creatures like whales of your planet. Detectors underwater wecord vewy complex talk, seems much more zan signal sounds. Computers still not understand language, which iss why some ask if language at all. I too beginning to ask same question, until message fwom Bewein."

"Berein—?"

The Silver female nodded. "I found a tribe of humanoids who use fire and build crude shelters." A long double-elbowed arm lifted and pointed. "They live on the coast, about fifty kilometers south from the delta." She groped in her carrying pack and produced a drawing. "They are a small people; about a head shorter than I am."

Bannion examined the drawing and then passed it to David and Silskin. "They remind me of Earth monkeys. But look at that tiny head! Where do they keep the brains which figured out fire and artificial shelter?"

"Zat is not all," David said.

"Unfortunately not," Berein agreed. "To start with, the humanoids were lighting fires, putting them out, erecting shelters, and then promptly dismantling them—all with no apparent purpose. And also there were whales. There were at least five of them cruising back and forth in the bay, no more than two or three hundred meters from the shore. I watched for two days, and there was no change. The humanoids played with their fires and shelters, and the whales

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continued to cruise. But on the third day, the whales departed—and this is when it really became strange. Because even as the whales were swimming out of the bay, the humanoids simply stopped what they were doing and wandered off. Less than an hour later there was a rain storm which put out the fires and blew down most of the shelters, but the humanoids did not return."

"And neither did the whales?"

"Not during the few hours I remained. Anyway, I decided it was important enough to signal the watch ship and have them pass the message on to Alchemy."

"You see?" said the Phuili. "Whales may be intelligent. We know zat for long time. Now Bewein find anozer species which also may be intelligent —except intelligent only when whales near. As I say. Iss confusing."

"What about other species?" Bannion asked. The human was looking at two lizard-like creatures with wings and feathers. The creatures were perched on a rock, watching the activity through tiny unwinking eyes. Another was circling low overhead.

"The watchers?" Berein showed her fangs in a grin. "They are always around. They were the first form of animal life the people had to get used to. At first we tried to kill them, but the creatures simply kept coming. Now, they are just part of the scenery."

"And that is all the creatures do? Just watch?"

Berein shrugged. "I suppose they are hatched with a natural curiosity. Momma Gia once told me there are Earth creatures like that."

Bannion walked closer to the rock. The two creatures swiveled their snouted heads and stared at him. Bannion shivered. "No, Berein. Not like that."

'Observe. There are now three kinds of being.'

'I observe. I also observe that since their conveyance returned to the sky, the remaining four—despite their dissimilarities—cooperate with great efficiency.'

'One of the two gray-furred ones did not come from the conveyance. It came inland from where the others of its kind are clustered.'

'Interesting. The new ones could have come down to the clusters but chose not to. Instead, one individual made an arduous journey to meet the new ones in this separate place.'

'Many questions need to be answered. We must speak to them.'

'It has been tried. But the processes of their thoughts so far elude me. It will take time.'

'Look at that machine they have assembled. I believe it is designed to fly.'

'I agree. Those blades at the top, when turned, will bite the air like the wings of our flying eyes. Where will the machine take them?'

'Not to the clusters, I think. They have already avoided that place.'

'Then they will go to the place where they think there are other thinking beings.'

'Of course. And it is there we will wait for them.'

The helicraft could only carry two. So while David and Silskin stayed at the bubble hut to set up the remaining equipment, Berein flew with Bannion

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to the bay where she had observed the small humanoids. Each wore a compact headset which contained visual and audio pickups. They landed a few hundred meters from the site, then approached on foot just above the shore, threading their way between trees whose heavy, spade-like leaves constantly dripped moisture, although the sky was cloudless. Bannion shivered. "Gad, what a place. It's a combination of tropical forest and arctic tundra; wet and cold!"

Berein grinned as she shook a cloud of water droplets from her fur. "You will get used to it."

"I do not intend to be here that long," the man grumbled. Suddenly he dropped prone to the sodden ground. "Smell that?"

Berein crouched beside him. "Wood smoke." Cautiously she lifted her head. "I think they have moved from where they were before." She wriggled back down the slope, then ran stooping to another viewpoint. Bannion joined her as she peered from behind a large boulder.

The shore was close, a hundred meters to their right. About the same distance in front of the watching human and Silver, a group of chattering monkey-like creatures were throwing wood on a fire, while further away in the clearing another was busy rotating a pointed stick in a dry log. A few wisps of smoke were already rising. "That one is a regular little boy scout," Bannion whispered. "But why does he bother? They already have a fire."

Berein pointed to where others of the creatures were pulling apart an igloo-like structure which had been built with rocks and mud. "When I was here before, they were playing with shelters made from branches and covered with leaves. Now look at them!"

"David, are you getting all of this?" Bannion asked.

'Yess,' Davikinapwottapellazanzis's sibilant Phiuli voice replied through the headsets. 'I wish to make expewiment. Pleese to show yourselves.'

"Why?"

'You find out. I zink you be surpwised.'

Slowly, Berein and Bannion rose to their feet and came out from behind their place of concealment. The activity in front of them continued without pause, even although some of the creatures were already faced in their direction.

"I don't get it," Bannion muttered as he and Berein ventured down among the creatures and were still enthusiastically ignored. He took a burning brand from the fire, walked over and touched it to the dry kindling the "boy scout" had placed around his rotating stick. The kindling instantly caught fire. But the diminutive operator kept rotating the stick as if he was either blind or in a trance. Bannion quickly smothered the flames before they burned the stubby three-fingered hands. Then he squatted in front of the creature and studied it. If its eyes saw the man, its brain—or what there was of an organ of thought inside its ridiculously tiny skull—seemed occupied with other considerations.

'Not much wiz which to zink,' David observed quaintly. 'Zerefore must be under contwol. Now pleese go to water.'

Bannion looked at his Silver companion. Berein shrugged and led the way through the trees to a narrow beach. The air and sea were calm. Small wave-

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lets lapped pleasantly almost to their feet. Bannion felt uncomfortable. His head ached and vague shadows of indistinct thought haunted his mind. Out from the shore a group of three small black islands heaved in a slow swell.

'As I zought would be,' David said. 'Whales.' Suddenly Bannion and Berein heard a strange sound in their headsets, almost a gasp. 'Link unit! Max twansfer—'

At first, Bannion did not know what the old Phuili was trying to tell them. Perhaps the device back in the bubble hut was glowing on all indicators, suggesting a furious rate of information transfer between somewhere and the mother ship *Stapledon*'s data banks. But at that moment, the man did not particularly care. Much more immediate were the dark waves crashing against the inside of his skull like the raging of an internal sea. He dropped to his knees, his pain-confused senses only vaguely informing him that Berein was already down, curled into a fetal position and moaning. Suddenly the pain was gone, and for a few seconds Bannion remained on his knees savoring the glorious relief.

'Kel! Bewein! Pleese weply!'

The man struggled to his feet. More slowly Berein uncurled and stood erect. She waited a moment, her head tilted to one side as if she was listening to something only she could hear. "I am alright," she said finally.

"So am I," Bannion said, "David, what happened?"

'I want you tell me. Link unit show maximum two-way twansfer of data to *Stapledon*. Headsets you wear are only operwating sensors wizin wange.'

Bannion shook his head. "All I know is that my skull felt as if it was about to explode." He reached up to remove his headset, but Berein restrained him. "It is all right," she said. "It is over."

"How do you know?"

Instead of answering, she pointed out into the bay. "Look. Our friends are leaving."

The three islands were moving, each leaving a slight wake on the dark water. One of them sank out of sight, and for a few seconds there were only two wakes heading toward the open sea. Suddenly something huge erupted out of the water, twisted in midair, then fell back with an enormous splash and disappeared. As the water calmed, the human and the Silver remembered a fat finless body with a gaping funnel-mouth and a ring of orifices around the tail. "It wanted us to see," Berein said. She was not just suggesting a possibility, Bannion realized. Somehow, Berein *knew*.

The monkey-like creatures were gone. Unattended, the fire still burned. All that remained of the igloo was a scattered pile of rocks. The firemaker's stick lay on the ground below the dry log and the little heap of partly burned kindling. Bannion picked up the stick and felt the point. It was still warm.

As they headed back toward the helicraft, Bannion said, "You did not answer my question. How did you know it was over?"

Berein looked at him. The fierce pug-nosed face was softened by a strange tranquility. "The whales told me," she replied simply.

The conference must have been one of the most unwieldy and expensive ever

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called. More amazing, was the fact it had been called by a distinguished Phuili who—by Phuili standards at least—had thrown caution aside and acted with almost indecent haste. But David had learned to trust his instincts, and the voices which came into the bubble hut, although powered across the light-years with enough megawatts to heat and light a continent, did not criticize his decision. Instantaneous physical transfer was possible only between the worlds on which a mysterious and long-lost civilization had created the appropriate "gates," and Colony was not one of those. So if not all the participants could be there in body, their tachyon-born opinions carried just as much weight. Especially those of Gia Mayland.

Speaking from half-way around the curve of the galaxy, the director of Project Alchemy underscored the dilemma as she asked, 'But why does it have to be such a bad thing? If the whales had that effect on Berein, is it not possible they can work the same miracle on everyone in the settlements?'

Another voice, this time from Earth. 'Frankly, I believe we can better protect ourselves by concenrtrating on the negative possibilities,' the science advisor to the World Union Council suggested. He added, 'According to the informed opinion of several reputable psi researchers, the range of mind-to-mind contact has no theoretical limit. If that is true, what is the potential of a whale-Silver combination on Colony? Is it possible for a world to radiate anti-life into the galaxy?'

Berein said hotly, "The Silvers on this world are not like that! Neither are the whales!"

'Unfortunately, conscious behavior is much easier to modify than basic instincts,' the science adviser said. 'If the whales manage to contact the minds of those in the settlements, and if in their innocence they tap into the level which is anti-life, they may release a malevolency which in turn will overwhelm them.'

Kel Bannion snorted. "Sir, don't you think that is a mite overdramatizing?"

"Fact of Silver instincts infecting whales, perhaps iss so," David said. He added, "Or perhaps iss not so." He was staring at the link unit as if he could see through its dull casing to the faces which belonged to the incredibly distant voices. "But because we not have pwoof, we must decide what must do to pwotect galaxy if worst case is twue. Cannot wait long."

Next, the staccato consonantal speech of one of the ruling Elite on the planet Phuili. David listened, replied in the same language and then translated, "Iss agweed may be gweat danger. But, as Gia say, also possible gweat good."

'Good or bad,' said the science adviser, 'it really does not matter. If there is no proof either way, we will have no choice except to sterilize.'

Gia Mayland was furthest from the bubble hut on Colony. But although her voice was blurred by the tachyon interference from a thousand suns, her concern was not dimmed by the light-years. 'Please! Do not even consider sterilization until we have considered every considerable option. Berein, tell us again. What did the whales say to you?'

"They said they wanted me and my kind to be their friends, Momma Gia. For many generations they have sought

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a way to implant the seed of intelligence in other species, so that eventually there can be a land-sea partnership which will know and love all of their world. When Kel and I arrived at the site of one of their experiments, they reached through our headsets to the database on the *Stapledon* and so learned our language. The breakthrough was difficult for them. So much so, the three who spoke to me suffered serious dysfunction and may not live many more seasons. And they chose me rather than my human companion, because they know there are already many of the Silver People on Colony. Although they can control, they solemnly promised they never will. They want us as friends and partners."

Bannion said, "I believe Berein is telling the truth, or at least what she knows of it. After all, I was there, although I was not part of the communicating. But let's be honest with ourselves. The possibility of whales controlling all the Silvers on this world, is not in itself what we are afraid of. It is what might happen if there is feedback of that part of the Silver psyche we all so desperately fear! Gia, Berein, can we afford that risk?"

"Please, we must!" Silskin almost shouted. Although the male Silver could not join with his sister in hand-to-hand secret talk, he sensed a choice for his kind beyond that of destruction or isolation. With an effort he controlled his excitement. "Whatever is going to happen, will not happen so quickly that we cannot afford a little more time to determine if it is good or bad! Let Berein contact the whales again. Let *me* try!"

'Yes,' agreed Gia Mayland from across the light-years. 'Surely, we can at least spare a few days for that.'

David said soberly, "Not wise to fix pewiod of time to measure if safe, because we not know if hour, day or year. Instead, Bewein must weturn to settlements so she can observe and weport what happen if whales attempt contact wiz Silvers. Second, Silskin and zis one go in flyer to seek place where perhaps whales talk to Silskin."

'Agreed,' said the man on Earth after a moment's consideration.

'Agreed,' said the Elite on David's home world.

'If it is the best we can do—' Gia Mayland hesitated. Then; 'All right. I agree.'

Nearly thirty thousand kilometers above the bubble hut, the *Stapledon*'s energy-hungry tachyon generator began to whine down. The star ship's crew relaxed as power returned to the temporarily reduced life-support and hull-shield systems. Within the hut, David turned to his three companions. "First Kel weturn Bewein in flyer to settlements. When he get back, he wemain here and welay messages from Bewein while I go wiz Silskin to find whales. If she signal zat whales are talking to Silvers in settlements, Kel order down pinnace and wecall us in flyer. We may have to leave planet fast."

Berein shook her head. "I will not leave. Whatever happens, I belong here on Colony."

The Phuili nodded. He did not seem surprised. "If whale-Silver contact fwiendly, pinnace wemain on gwound. If exchange of anti-life, we go."

"How will we know the truth of what

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Berein signals?" Bannion queried. "She may not be—ah—"

"It will not come to that," the female Silver said firmly. Suddenly she grinned, her fangs gleaming under the hut's glow tubes. "But if you think every Silver on Colony is suddenly going to start foaming at the mouth, why don't you watch Silskin?" Almost wistfully, she patted her brother's gray-furred cheek. "If it is the worst, he will tell you."

"If it is worst," David said, his sad eyes expressing the love he felt for this being he had co-parented, "you will be on planet when we make end of pwoblem." He turned away as brother and sister embraced.

David first piloted the heliflyer to the bay where the whales had "spoken" to Berein. As the old Phuili hovered the machine a few meters above the sea's surface, Silskin lowered an underwater sound detector and instantly picked up a cacophony of roars and hoots. It was, they both knew, the open line by which whales communicated across half the planet, and by itself was not an accurate indication of where the beasts were located. But David had a theory. He pointed at a feathered lizard which was orbiting above them.

"Some whales not far. Zey still watch us."

"The lizards? But Berein said—"

"Bewein too close to pwoblem. If whales can contwol monkeys, whales can contwol flying creatures. What Silvers zink is part of scenery, is how whales know what Silvers do."

Suddenly the lizard dived in front of the flyer and sped away low over the water. Just before it vanished into the distance, it turned and climbed back above them. Then it repeated the maneuver. And again—

"Silskin, bwing up detector. We follow lizard."

Quickly the small unit was reeled back into the flyer as David locked the image of the lizard on the nav screen and instructed the computer to "follow that target." At a surprisingly fast two hundred kilometers per hour, the lizard led the flyer toward the first of the chain of islands which extended more than two thousand kilometers into the huge ocean which covered eighty percent of the planet's surface. After about fifty kilometers, the lizard dived toward a tiny speck of land which was barely more than a rock. David took one look at the precipitous sides and jagged summit of the island and quickly assumed manual control. "No good," he said. "We weturn—"

Silskin pointed. "We don't have to. Look, there is another lizard."

The second lizard was already in front of the flyer and maintaining the same course as its predecessor. The Silver said wonderingly, "One gets tired and another takes over. Do you believe that?"

David, as literal minded as most of his race, nodded his long head. "I see it. Zerefore must believe." Twice more he had to disengage the computer as the lizard relay continued, until finally they were led down to a broad beach on the shore of a low, treeless island. As David and Silskin emerged out of the flyer, the lizard they had been following landed on the sand a few meters away. Silskin went to the creature and squatted in front of it. It watched him incuriously. "Do

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they only *see* me through those beady eyes?" he wondered aloud. "Or can they also hear through their ears?"

We do not need its ears, said a voice in his mind. *It is not sound which brings your speech to us.*

Although Jase Kurber had reminded his wife they were supposed to be relaxing for a few months, he had the sense to realize her decision to go to Earth was irrevocable. In any case his own dedication to Alchemy was almost as strong as hers. So as the shuttle flew over Serendipity's green-gold mountains toward the sphere of light which was the transfer nexus, he firmly put aside his regrets. As sure as this lovely planet was here, they would return. Meanwhile, there was a small matter of making sure the hawks of two races would not again destroy a world.

The shock of transfer, the brutal sensation of being torn apart and reassembled, was a little more tolerable now that they had done it so many times. But as the shuttle emerged over the endless deserts of the world to which all the gates opened, Jase found himself uttering the usual curses against the long-vanished race which had forced this unpleasantness on those who needed to move around the galaxy in a hurry. He looked at Gia. She was just finishing her ritual of ten deep breaths. She smiled wanly. "I wish you would add one or two new words, dear. A little extra blasphemy would be nice."

Kurber grasped her hand in his. "Believe me, I am thinking about it." He looked through the window at the Shouter's Mars-like landscapes. In the distance, atop an incredibly slender pylon, a horizontal bowl pointed at the sky. Above the bowl, a flickering sphere of radiance. There were more than nineteen thousand similar AA's or "alien artifacts" on the Shouter, each a gate to its own destination among the stars of the Milky Way. About seventy minutes flight time over the curve of the planet was AA 6093, the gate to Earth. And after the gut-wrenching transfer to the nexus on Akimiski Island in Canada's Hudson Bay, there still remained the nearly two hour flight to World Union headquarters in New York. Kurber sighed. It would have been nice to visit a few old friends here on the Shouter. But this was one of those rare flights which had been cleared right through. Gia Mayland still had the power to cut through a lot of bureaucratic red tape.

Zero time to travel across the galaxy. Nearly four hours winging through the atmosphere of three planets. A sense of the ridiculous was needed for this kind of travel, as it was to tolerate the series of security checks through which they had to pass before Gia Mayland and Jase Kurber were ushered into a small conference room eight levels below ground level in the Expediters wing of the W.U. Building.

Expediters's aging director, Peter Digonness, came forward to shake their hands as they entered. Then he introduced the others in the room. Harold Huwang, representing the ailing chairman of the W.U. Council. The portly Jeferson Cranbridge, science adviser to the Council. "Mason," the Phuili ambassador to Earth. And on the center of the circular conference table, the newcomers saw the unmistakable shielded box of a tachyon link unit.

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Digonness opened the proceedings. "When Gia Mayland tachyoned me from Serendipity and asked me to convene this meeting, I admit I thought she was overreacting. But when I learned that you, Dr. Cranbridge, had already recommended action to contain the Colony problem, I realized the matter was more serious than perhaps even Gia had suspected. Colleagues, we have been down this road before. And we know what it cost us. Because we believed the Silver People were about to take their anti-life crusade into the galaxy, we deliberately destroyed their solar system and its billions of sentients. Yet despite that terrible act of mass slaughter, we solved nothing. We may, in fact, have triggered a situation which in the long run is much worse! Fifty arks, each carrying thousands of stasis-preserved Silvers, were scattered into the anonymity of interstellar space even as we exploded their sun."

The director paused. He felt a certain comfort from the presence of the two expediters, although he suspected their connection with Project Alchemy did not sit well with Huwang's notorious need for what the acting chairman had always insisted must be absolute impartiality.

"At least we gained time. It will take years before any ark reaches even the closest star to the original Silvers' system. So far, we have found two of the arks. One, we had to destroy—although out of the particular disaster, we did save the six infants who became the core of Project Alchemy. The second ark we were able to divert to a target system of our own choosing. As of this moment, the survivors of that ark are slowly learning—with the undercover aid of one of our own Silvers from Alchemy—to accommodate themselves to living matter. They are also—"

Cranbridge interrupted with an irritable; "Please, Director Digonness, we know all that. And I admit that what we are accomplishing on Colony is entirely laudable. But that opportunity is now a threat! If a gun is pointed in your direction, do you refrain from counteraction just because there is a possiblity the gun is not loaded?"

Huwang said gently, "Ambassador, I understand your people have been in contact with the Phuili representative on Colony. What is the latest information?"

"Not change fwom last time," the Phuili said briefly. "Except zat second Silver fwom Alchemy iss now talking wiz whales. He say whales wepeat message saying zey seek welationship wiz cweatures on land."

Digonness checked the wall clock. "In less than one minute, we will reestablish the tachyon link to Colony. Does anyone wish to say anything before the link is opened?"

"Get our people away from there," Cranbridge said. "One way or another, all hell is going to break loose."

"You are wrong." Practicing a technique she had learned from years of association with the empathetic Phuili, Gia met the unblinking gaze of the science adviser. After a few seconds, he lowered his eyes and stared at his hands. *That man is not what he seems. What is his game?* She added, "We have found another intelligent race. Must we add them to our guilt?"

The light on top of the link unit began

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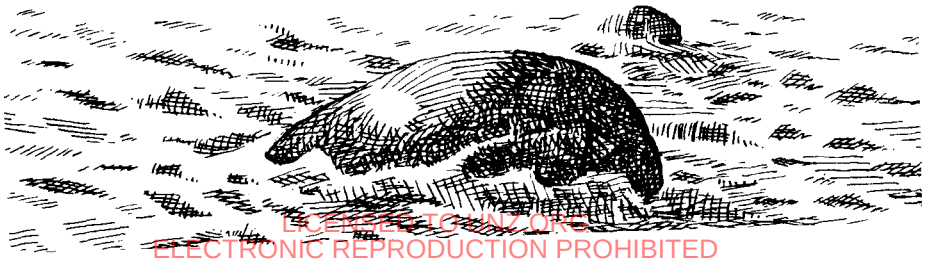

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to blink. Digonness smiled and nodded at Gia Mayland. She said, "Hello. David?"

Davakinapwottapellanzanzis was grateful his old friend had finally made the choice to get involved. Although he knew he was almost revered on his home planet, and even that humans regarded him with enormous respect (Like all Phuili, David was mildly puzzled by that peculiar human weakness known as modesty), he also knew the volatility of the situation could not be eased by the mere application of patience and restraint. The human Cranbridge had his counterparts among the Elites of Phuili, xenophobes who would "reluctantly" accept sterilization of the Colony system while blaming its necessity on human management. Gia's presence among Earth's decision-makers would be invaluable.

He went outside the bubble hut. Bannion and Silskin put down the power cell they were about to install in the heliflyer. "Have they made a decision?" the man asked.

David shook his head. "Iss postponed. Gia persuade zem to wait. But not know how long. I also spoke wiz ambassador fwom Phuili. He say what humans do, Phuili also do." A strange, almost savage expression fleeted across the canine features. "If stewilization is done, and is found to be wong decision, Phuili can zen blame humans."

Bannion nodded sympathetically. David had told him of the Phuili faction which would stop at nothing to embarrass the *flatfaces* of Earth. "If a decision is to be made by the Council, at least we know Gia is there to counterbalance that idiot Cranbridge."

"She say she lobby ozers of Council. But so will one you call idiot." David's large violet eyes narrowed in concentration. "I zink zat one is twouble."

"What makes you think so?"

"He say pwecautions alweady taken."

Silskin laughed aloud. "Poppa David, how can he even threaten to turn Colony's sun [illegible] without sunseeds? Even if he has the authority—and as you have often told me, no one man or Phuili has that kind of power—it will still take months to ship sunseeds to this system from the nearest gate on Hefron Two. So if that [illegible] believes Colony's evil Silvers can take over the whales and send a telepathic blast of anti-life into the galaxy, he also knows it is going to happen soon. Even before the seeds reach the Hefron gate!"

Bannion nodded. "My boy has a point."

David's jaws twitched. "I zink what Silskin say is what humans call overkill. Not need sunseeds to kill few zousand Silvers."

The old Phuili did not need to explain. Bannion whispered, "My god, if you are right—" He turned toward the bubble hut, but was stopped by a stentorian "Not do!" from the diminutive alien.

David added quietly, "Iss not good tell people [illegible] we suspect."

"Which leaves us damn few options," Bannion muttered crossly. He gestured at the sky. "They are there and we are here. How can we know if there has been any kind of takeover—or even if a takeover was necessary?"

David turned to the Silver. "Silskin,

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you good wiz computer. Get complete officer and cwew list from *Stapledon* data bank. As long as zey not know we suspect, zey not check normal data twansfer."

"Yes Poppa David," the Silver responded as he ducked into the hut. A few minutes later, he called out to them. "I have it stored in the memory. Do you want to see what we've got?"

Bannion followed David into the hemisphere. Silskin had unfolded the fifty centimeter display screen from behind its keyboard. "How do you want to view the information?"

"Political affiliations," Bannion said promptly. "See if anyone is or was associated with the Lecfras Party on Earth or the Human Eaters on Phuili."

Silskin looked up. "Who?"

"Lecfras. Started by a right wing racist, Lector Fraser. The Human Eaters are the Phuili equivalent."

David nodded. "Only ones zey not like more zan humans are Silvers. Or any ozers who are not Phuili."

"All right." Silskin quickly tapped the appropriate keys. Three names appeared on the screen.

Bannion blinked. "First Officer Devries? And Jinette Queegan—" His eyes widened. "She's the Medical Officer!"

David pointed. "Ekafrokopennfrikiziz. One humans call Eka. She Sub Elite twained for what you call exobiology."

For a few moments there was a discouraged silence in the hut. What they had learned was proof of nothing, although it was a strong indicator. If Phuili and human society had anything in common, it was the existence of fringe political groups which took great care to remain within the framework of the law.

"A few facts and a helluva lot of ifs," Bannion commented angrily. "How do we prove anything? Even to our own satisfaction?"

"Iss difficult," David agreed. He thought for a moment. "*Stapledon* have nuclear matewial for geological blast charges. Easy to make to bombs and dwop on settlements fwom pinnace. Also easy for medical officer to make captain sick so first officer take ship. And because Eka iss senior Phuili on board—"

"Just a moment," Bannion interrupted. "If Eka is an exobiologist, shouldn't she be down here with us instead of still on the ship?"

"Wemember she say she come down later. Still have study work to complete."

"That is convenient."

"Not zink so," David said, still being literal-minded. "She part of takeover."

"Look, if we call the ship and ask to speak to the captain—"

"Why would we need ask for captain? Zey would ask why we ask." David shook his head. "We nee plan—"

"We have great trouble. The Silve People are flawed."

'I know. I have also detected th flaw.'

'It is totally illogical and yet it exist We must take extreme care.'

'We withdraw?'

'That is the last thing we must d The sickness will not depart merely b cause we ignore those who are sick.'

'Are they aware they are sick?'

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'They are aware, although they do not regard it as a sickness. To the Silver People, the only sickness is living matter.'

'Yet they partially subsist on such matter.'

'Only because it is necessary. I read in them a thing called rationalization.'

'There is more than that, I think.'

'Indeed. Much more. For instance, the two who are not of the others fear a terrible consequence if we interchange with the 'wild ones' of their kind. They believe we in turn may become infected.'

'They are wrong.'

'Of course.'

'So why do we still restrain from full contact?'

'Because an irrationality has happened in the ship beyond the sky. In its ignorance, that irrationality is prepared to destroy before it allows itself time to reason.'

'The destruction must not be allowed to happen.'

'We must watch.'

'We must decide.'

'And then we will act.'

David's illness was not feigned. The manuals clearly described the appearance and toxic nature of the plant with a spike which ejected like a tiny arrow, so it was a simple matter to arrange an "Accident." The old Phuili was almost unconscious when the pinnace came down, and the urgency of his condition did not allow time for argument when Silskin insisted on accompanying his beloved mentor back to the *Stapledon*'s sick bay.

The *Stapledon* and her sister ships were survivors of the era which existed before the galaxy was opened up by the star gates. Each was designed to carry thousands of colonists on voyages which could last years, and was necessarily of enormous proportions. The great ships had their decades of glory, until they became orbiting white elephants—as those who would have been their passengers began the Great Exodus through portals which brought twenty thousand worlds as close as the next town.

Yet there remained worlds which did not have star gates; backwater planets which for various reasons needed to be accessed. So the old ships were refitted and their phase-shift FTL drive systems returned. The ships were not returned to continuous use; there was not enough demand for that. But they were available when needed, although their cavernous holds and echoing dormitories would never again be filled with the goods and people of colonization.

So it was to be expected that the one-hundred-meter walk from the pinnace lock to the *Stapledon*'s living section would be a lonely one. Nevertheless, as Silskin hurried after the crewman who was pushing David's stretcher, the young Silver sensed an unease in the air which was beyond the sadness of empty corridors. Even the crewman remained remarkably uncommunicative, just as he had been during the fifty minute ride up from Colony's surface. But despite Silskin's fear of a possible coup aboard the ship, as well as for David's deteriorating condition, he bravely continued his role as a frightened student concerned only with his teacher's well-being. Perhaps, also, he was helped a little by the calm presence who was felt but who remained strictly apart.

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Doctor Queegan was waiting, the antidote already prepared. She was familiar enough with Phuili anatomy; she did not have to waste time poking around David's alien musculature. She found the proper spot, and the injection gun hissed almost before Silskin was aware it had been done. Instantly the cramps which were wracking the old Phuili's body began to subside, and the large eyes closed in grateful relaxation.

The doctor smiled. "Don't worry. He will be okay."

Silskin was so relieved he almost forgot the real reason he was aboard. But his lapse was only momentary. His eyes widened as he glanced at the other bed in the tiny ward and recognized its occupant. "Captain Skavonian!"

Jinette Queegan turned to her other patient. The captain's face was flushed, but he seemed to be sleeping peacefully. "Rhinehouse swamp fever. The virus must have been dormant within his system for years." She shrugged. "The prognosis is for a complete recovery, but it will be months before he can resume his duties."

"So Mr. Devries is running the ship?"

"Of course." She looked questioningly at the Silver. "Is there any reason why he should not be?"

Silskin quickly changed the subject. "When can I talk to David?"

"Soon, I think. Meanwhile, I suggest you get some rest. I am no expert on a Silver's physical needs, but I suspect you have been in overdrive more hours than is proper for any being."

She was right of course, and Silskin knew it. But what the doctor probably expected would take hours, he knew his body could accomplish within minutes. The racial ability to "catnap," developed when survival depended on a split-second ability to surge from sleep to flight, could serve him well in the current situation. So he showed his pointed teeth in a wan smile. "Thank you for reminding me. Please tell David I will come and see him in a few hours."

He did not meet anyone as he went to a vacant cabin. Even within the small section of the ship which was occupied, the twenty crewmen and a few passengers could easily lose themselves. So Silskin was grateful for the respite, although he did not doubt he had been closely observed since the moment he came aboard.

Rhinehouse swamp fever my tail! he thought with amusement as he mentally paraphrased what he was sure Kel Bannion would say. Again, just before he dropped off to sleep: *so David is right. Now what do I do?*

And then Silskin dreamed.

He saw a ferocious landscape in which clawed and toothed animals competed with carnivorous plants for the limited protein which was nontoxic and relatively defenseless. It was a situation in which "defenseless" was a relative term, because the small group of gray-furred humanoids who were battling toward their cave halfway up a nearby cliff, were fighting back with spears, clubs, and deadly-aimed slingshots. When they finally reached the cave, one of their number was already reduced to a pile of bones under the heaving mound of voracious life which had formed after an armored monster had pounced and instantly removed half its victim with one bite.

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Silskin knew he was viewing an incident from the dawn of his species, probably when the genetically programmed instruction to "cooperate with each other and kill everything else" began to lift the proto-Silvers up the brutal road which led to domination and then extinction of all the other lifeforms. For a brief moment he saw his world as it must have been just before it was destroyed; its barren landscapes and sterile seas, the pall of perpetual industrial smog. With a sudden and overwhelming sense of shame, Silskin realized the human-Phuili action which caused the Silvers' sun to turn nova was merely the capstone of the eons-long process started by the Silvers themselves.

"It is why they fear you,' a voice said in his dream.

'But we are no longer like that!' Silskin protested hotly.

'Perhaps not.' Then, gently, *'Yet even you fear that which you suspect is slumbering within you and the others of your kind—a malevolency which, perhaps, can be triggered by a mere tendril of alien thought.'*

'But I am not being changed by your thought—' A hesitation. *'Am I?'*

'Look into yourself, young one, and know that is a foolish question. Like most creatures of the id, your monster casts a shadow which is more fearsome than the reality. Face the monster for what it is, not what it appears to be. Only then can you do what must be done.'

'Must be done? I do not understand.'

A sense of impatience. *'We are not omnipotent. Although we are in contact with parts of your conscious and unconscious mind, it is only with great effort. To attempt also to reach those around you, will take time that you and we do not have. Young one, you are still immature. Yet you possess powers which are truly remarkable for one not born within the ocean's serenity. Therefore use what you have to serve those who need what only you can give. Completion needs the land. The land needs the sentient mind.'*

Silskin woke abruptly. He glanced at the clock, and was relieved he had spent less than an hour in the silent cabin. For a moment he considered the dream. Was it real, he wondered? Or merely a rationalization from a wish-fulfilling subconscious? He focused his thoughts and tried to direct them at the planet below the orbiting star ship. Hello? he called tentatively. *Hello?*

There was no reply. Only his own thoughts, confused by doubts.

Hello? he repeated.

Still no reply. But suddenly a sense of warmth, of fond reassurance.

Silskin smiled. "Thank you," he whispered into the darkness.

As David struggled to awareness, he found to his discomforture that Ekafrokopennfrikiziz was standing by his bedside and watching him. That she happened to be an attractive female of his species was immaterial; in the inflexible Phuili context, sex never intruded on other matters. But if she was, as he suspected, a conspirator—

She said, "It is evident you are recovering. I am pleased."

"Yes." He held up an arm and it wavered only slightly. "Soon, I think I can return to my work."

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"It was a most unusual accident, was it not?" The large violet eyes regarded him solemnly. "The sting plant is well documented and easily avoided."

She knew, of course. As he was equally certain of her own duplicity. The Phuili empathetic sense is a remarkable phenomenon, in its way almost as deception proof as the secret-talk of the Silvers. Nevertheless, the proprieties had to be observed. "Even the most unlikely accidents happen," David remarked blandly.

"That is true," the female agreed. "It is also true that correct and necessary actions are often condemned by one's contemporaries, even though those same actions are later favored by history. Do you not think that is so?" Without waiting for a reply, she turned away and quietly left the room.

David knew exactly what she meant, and felt a sadness at the prospect of another tragedy caused by well-meaning individuals whose ethical sense was unbalanced by ignorance. He cautiously pushed himself up into a sitting position, and then swayed onto his feet. For a moment his stocky body felt strange, as if it belonged to someone else and he was merely an observer. But with an effort of will he focused inward, forcing a resumption of communication from mind through brain to nerves and musculature. It was not a pleasant experience as feeling arrived on pulsating waves of pain, but the old Phuili toughed it out until he could stand and then begin to walk without support.

"What are you in for?" the human in the other bed asked weakly.

"Captain?" David had already become vaguely aware he was sharing the sick bay with a fellow sufferer. But now that he knew the other's identity, he was totally unsurprised. Ekafrokopennfrikiziz had already confirmed most of his *suspicions, so it naturally followed that* Captain Skavonian's ailment—whatever it was—was much more than mere coincidence. David went over and grasped the other's wrist. He had made a hobby of human physiology, so it did not take him long to determine that the captain's pulse, although faint, was regular. "I was poisoned by sting plant," he replied as he released the limp hand.

"Ah." The captain smiled. "With me, it's Rhinehouse fever." He sighed. "Seems I must accept the fact I will be out of circulation for a while."

"Iss unfortunate. But doctor tell me pwognosis for you iss complete wecoverwy."

"Unless I end up being bored to death." The captain winced as he took a deep breath. "At least the ship should be okay. Cass Devries is a good man."

"Yess." David was tempted to ask about the *Stapledon*'s executive officer. But because logic insisted it was not an accident he had been left alone with John Skavonian, he decided to disappoint whoever was listening. "If you not mind, I leave for while. Want to find my pupil, Silskin."

"The Silver?" The human's tired eyes showed interest. "I liked that one. What brought him up from the planet?"

"He want make sure I get well."

"Now that is interesting." A wheezing chuckle. "Considering he comes from a race of homicidal maniacs."

Had David been human, he would have bristled. But his empathetic sense discerned the compassion camouflaged

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behind the apparently thoughtless remark, so he did not take offense. Instead, he told the captain seriously, "What we find at Alchemy and now pwove on Colony, is zat pwognosis for Silvers also good. Instinct for anti-life not genetic. Iss social."

"Oh?" The captain tried to lift his head from the pillow, but the effort was too much and his head dropped back. Nevertheless, he managed a smile. "Thanks for telling me. So there is hope for us sinners yet."

David knew that he was referring to the genocidal precedent which had almost wiped out the Silver People. In light of the apparent monomaniacal determination of that race to destroy every form of life other than its own, the decision to turn the Silvers' sun into a short-lived but thoroughly destructive nova had at the time seemed the only one possible. But the legacy of guilt—for both Phuili and humans—was heavy. So the possibility that the surviving Silvers could be reoriented into a small but dynamic segment of the emerging galactic scene, was a desperately needed catharsis which could not come too soon.

But a few minutes later, as David trotted through the corridors of the silent ship and reflected on the tragic irony of a sentence of death being pronounced even before guilt was established, he wondered how the captain would react if he learned of the plans to launch a mini-genocide from his beloved *Stapledon*.

When he entered the enormous vessel's control center, everything seemed to be normal. The duty crew were on station at the various control consoles; some talking among themselves, others reviewing and updating data, and a few performing minor and probably unnecessary adjustments. A ship in natural orbit is a dull place, which perhaps explains the wisdom of rules which specify full duty rosters even when systems are powered down or on automated standby. Pablo Vinder, Nav Specialist, spotted the little Phuili and shouted, "David! Good to see you are still on the right side of death's door!"

Despite his many years of working with humans, David had never been able to fathom the logic of their humor. He said politely, "I well, zank you. You see Silskin?"

"Referring, I suppose, to that furry disciple of yours." Vinder chuckled. "Guess he got tired of bedsitting his teacher. Last I saw of him, he'd grabbed a package of sandwiches and was off to explore the ship."

"The Silver? That *creature* is wandering about without proper escort?" Cass Devries swung his chair around and glared at the N.S. The acting captain was a small man with an aggressive personality which overcompensated for his lack of physical stature. "I should have been told!"

"I did not think it was necessary, sir. After he has wandered through a few dozen empty spaces, I am sure he will be depressed enough to decide the front end provides much better company."

"Hmm." Aware he had overreacted, Devries muttered, "I suppose you are right." He turned to the old Phuili. "Davakinapwottapellazanzis. Do you mind accompanying me to my quarters? There are matters you and I should —ah—discuss."

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David was not flattered at being addressed by his full title. The human tongue was not adapted to Phuili speech, and sensible humans had long ago given up trying. But there were always a few, for reasons known only to themselves, who persisted with the ignorant grunts which were verbal caricatures of the ancient and honored sounds. Nevertheless the old Phuili inclined his snouted head. "I zink you also ask Ekafrokopennfrikiziz—" He deliberately exploded the consonants in a manner no human could even hope to duplicate. "—and Doctor Queegan to come."

The acting captain's plump features whitened at the clear message; *I know*. He turned away for a moment. Then he turned back to his tormentor and said hoarsely, "Under the circumstances, perhaps such a meeting would be —ah—appropriate."

After being politely escorted to a temporary restraining cell by two embarrassed crewmen, David was later taken to a room where Devries, Eka, and Doctor Queegan were waiting. As if to balance his former display of insecurity before the little alien, Devries launched into an impassioned tirade about the information leak which had obviously alerted those on the planet. The old Phuili listened quietly, his large eyes unwinking and thoughtful. He still did not react when Jinette Queegan pleaded, "David, you must not, you *cannot* stop us! If that horror is allowed to—"

"I zink we not more need fear Davakinapwottapellazanzis," Eka observed quietly. "What matter now is tachyon link in next minutes. Zen we know what to be done."

David made a quick decision. What he had already thought was the most likely scenario, he now had to assume was fact. "You will accept the advice of the individual called Cranbridge?" he queried in rapid Phuili. "I am amazed you would trust the word of one who is so obviously of extreme bias."

David empathed the female's surprise, although physically she did not show it. His almost blind shot had obviously hit its mark. "If you are referring to that particular human's desire to preserve the future," she retorted in the same tongue, "then I also am of extreme bias. As is Doctor Queegan and many others."

"Except those others, I think, are not on this human ship of space," David observed. "You are merely three."

She nodded. "It is not so easy to conceal our histories from those who choose to look." Her jaw twitched with the Phuili equivalent of a smile. "I checked the computer log for recent ground links."

That was not unexpected. David would have done the same under similar circumstances. He began to speak, but was interrupted as the acting captain impatiently demanded, "Eka, what does he know?"

"He know enough," the female replied obscurely. With total lack of guile, she added, "But iss expected. He Phuili."

Devries made a strangled sound. Jinette Queegan merely shook her head. "None of us will enjoy what I think we are about to do," the woman said. She gestured at her Phiuli co-conspirator. "David, after reading our files, you must know how difficult it is for Cass

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and I to work with one who is not of our kind—''

''—and for I to work wiz humans,'' the female said.

The doctor nodded. ''Exactly. But when the Silver problem is settled, I think we can arrange for the proper partitioning of the galaxy.''

Had David been human, he would have shivered. Despite the obvious physical differences, it was clear that human and Phuili had a lot in common—even, unfortunately, to the xenophobic streak which threatened to destroy the delicate fabric of cooperation which the progressives of both races had struggled to create. Here and now, in this speck of metal orbiting a planet of a minor sun, the future of a great experiment hung in the balance. For humans, Phuili, and for the Silvers, for the great creatures in Colony's oceans, even perhaps for the mysterious race which eons ago had created the galactic transfer network; events were trembling on a precarious balance between possible futures. For David and his friends of two other races, the choice could only be a continuation of the adventure which had begun with the realization that sentient life is infinitely more than individual philosophy or physical form; that it is in fact a force with the potential to link all things in a glorious web of search and discovery.

But for the conspirators and all those who shared their sincere yet irrational fear of the unknown which lurks in every shadow, the adventure had to be terminated before contamination could occur. Their outlook was myopic, their objectives short-range, the inevitability of a life-linked universe was beyond them. The centuries of stagnation and conflict resulting from their choice would, of course, eventually pass like a cloud before the sun. But as with the aftermath of all dark ages, the scars would not readily heal.

Suddenly the lights dimmed and then brightened again as emergency power cells took over the load lost to the surging demand of the activated tachyon generator. The indicator on the link unit flickered and then steadied as a familiar voice said, ''Code eight three. This is Churchill.''

''Code A nine-one,'' Devries replied. ''Dracula.''

Although David was familiar with the broad outlines of human history, he could hardly be expected to know the details. But he knew enough of the psychology of the humans involved; he would have understood the appropriateness of the code names as well as the paranoia which generated their use. Churchill, for the time when the famous English statesman was literally a voice in the wilderness as he warned his disbelieving contemporaries against the rising threat in central Europe. And the Romanian prince Dracula, otherwise known as Vlad the Impaler. He was chosen not so much for his bloody inclinations (which in any case made him a worthy counterpart to the fictional immortal), as for his inspired leadership against the armies of the alien Turk.

The one called Churchill did not waste time. ''Is the plan proceeding?''

''No problem,'' Dracula/Devries replied. ''Skavonian is in the sick bay and I have assumed command.''

'What about the Phuili?'

''Ekafrok—'' The acting captain

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flushed. "Eka has been fully supportive. As has Doctor Queegan."

'Is the pinnace functional?'

"I removed the C.F. scrambler as soon as I assumed command. The cargo is loaded and ready for use."

There were three pinnaces. Number two had been suffering control anomalies to such an extent, Devries had volunteered his services as an "acknowledged expert" and had been working on the problem almost continuously since the *Stapledon* set course for Colony. It was evident, David realized, the executive officer had done considerably more than merely rearrange a few circuits.

Devries asked. "What about Gia Mayland and that consort of hers? Have those two been making any more trouble?"

A sigh. 'They suspect of course, although it is obvious they expect some kind of legal move to push through a sterilization order. So they have been lobbying—enough, I might add, that any motion of mine would be overwhelmingly voted down.'

Devries's lips tightened. "That is a great pity."

'In the sense it means we are still on our own, I agree. But that does not change our objective, or our dedication to it. In any case, opinions will change. We will be heroes in our own time.'

David spoke up. "I zink not, Jeferson Cwanbwidge."

Devries cursed, the doctor looked surprised. Eka did not react at all. The long silence from the link unit could have meant anything, although David knew the main mover behind the conspiracy would be of sterner stuff than the ill-tempererd human who had taken over the *Stapledon*.

Finally, 'You are the Phuili they call David?' The voice from across the light years was calm and seemed only slightly curious.

Devries said hurriedly, "He's here because somehow he found out what is going on. I don't know how he got the information, but right now I guarantee there is not a damn thing he is going to do about it!"

"Iss twue," said Eka. "He not decide for Phuili anymore."

Another silence. Then, 'Let David speak. I would like to know what he thinks about this.'

David suspected that anything he could say now would be about as useful as raindrops on an ocean. Nevertheless, not to try would be an abandonment of principles he had held sacrosanct since the distant time of his youth, when the people of Earth were still restricted within their planetary system and even Jeferson Cranbridge's great-grandparents were young. So the old Phuili chose the human words with care. "For Silvers, anti-life iss belief which iss taught. Iss not in genes. We pwove at Alchemy, where we successful to teach young Silvers zat life is necessawy dimension of universe, like time and many dimensions of space. On Colony, we not have to teach. Zere it iss necessawy to know. Or if not to know, to die. And most on planet learn quick enough not to die. Which mean Silvers on Colony have met teacher called expewience. It also mean zere is not sickness to pass to whales. Human called Cwanbwidge, I say you can learn as Silvers learned. Be taught, as wiz young ones. Or by bad

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expewience, as wiz Silver People on Colony. Iss for you to make choice."

Despite the constant hissing of tachyon interference, Cranbridge's response at first seemed sincerely sympathetic. But as David had expected, the glib words quickly took on the pompous rigidity of a fanatic's absolute conviction. 'David, how I wish it was that simple. But as I believe I previously told you, conscious behavior does not necessarily match the primeval instincts of the id. In other words, I am afraid there is no way you can prove with unequivocal certainty that a menace of galactic proportions is not germinating on that planet. Neither can the Kurbers, although I can tell you now that they came to my office yesterday with almost the same argument. Fortunately they did not know what you know, or I am sure they would have arrived with an escort of security police.' There was the sound of a dry chuckle.

Then, sadly, 'If there was any way out of this tragic dilemma, I would not hesitate. Captain Devries would happily dismantle the devices aboard the pinnace, and we could all return to our respective lives. But this is a situation in which mere wishes cannot be allowed to stand in the way of a higher purpose. What must be done *will* be done. And the few of us involved will, of course, accept the consequences, which I admit will be quite severe for a period of time. Ultimately however, there is no doubt that most thinking individuals will appreciate the unpleasant necessity of our actions.'

There was a faint sheen of sweat on the acting captain's forehead as he reacted to an intense mix of anticipation, fear and guilt. He licked his lips. "Then we do it?" Devries asked hoarsely.

'I am afraid we must. The fact I arranged this tachyon link without going through channels, will be known within hours. Immediate action will at least allow a little time afterward to —ah—protect ourselves against the inevitable overreaction. Is it agreed?'

"Iss agreed," Ekafrokopennfrikiziz said solemnly.

The doctor's hands clenched until knuckles showed white. "It is for the good of us all," she whispered.

David said nothing. There was no point.

After a short silence, the man on Earth said, 'I am sorry David.' The hiss of tachyon static abruptly increased as transmission was terminated.

The ship's T-generator disconnected and the lights flickered as internal power returned to the main source. Devries opened the door and waved in the two crewmen who were waiting outside. "We are going to pinnace number two. Please bring the Phuili along."

As he went docilely between the crewmen, David chose to remain silent. Aside from the obvious fact that anything he said to the two humans would be heard by the others as they walked just ahead, none of the crew had any reason to doubt the legitimate nature of even a nuclear strike on Colony. Because it was well known that wild Silvers were anti-life, a simple announcement to the effect that the thousands down on the planet had reverted, would be an easily acceptable rationalization.

For any other individual, Phuili, human, or Silver, this would have been

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the time to despair. But there was a uniquely mystical side to David's nature which did not always accept what was patently obvious.

Somehow, he knew it was not over. Not yet.

'How soon?'

'Very soon.'

'It is difficult to wait for what may be the end.'

'Or the beginning. Do not forget that.'

'I do not forget. But what we try has never been done before. It is a very slender thread on which we suspend our hopes.'

'But I think strong enough. We are at a nexus of futures, in which even a whisper of current can change the world. It is such a tiny thing which must be done, but all our destinies have led us to it. Younger one, those destinies are not blind.'

'I want to believe you. Oh, how I want to believe.'

'Belief is a creature of patience. Wait with me.'

'It is here! Our flying eyes see it sliding through the sky!'

'There is death in its belly.'

'It is over a cluster.'

'Death falls—'

They had strapped David to a seat three rows back from the control section. Devries was in the left front seat, piloting the vehicle as it shuddered down through the upper atmosphere. The female Phuili was in the copilot's position, her pudgy hand hovering over a small control box which had been attached between the seats. Doctor Queegan had remained aboard the *Stapledon;* a symbolic gesture obviously agreed upon to emphasize the equal partnership of human and Phuili in this action.

The ocean was ending. Ahead, a smudge of coastline evolved into a broad river estuary with rising hills beyond. Devries started the jets, and the pinnace rumbled over the sea in level flight. "We're getting close. Better arm the charges."

Eka's hand hovered over the box. There was a sound like a gasp back in the cabin. "Charges iss armed," she said.

"OK." Devries turned the pinnace's nose slightly. There was a tableland, a glimpse of settlements. "Three targets, three charges. The targets are in line and close to each other, so release one-two-three when I shout."

"Weady." A finger rested on the first release button.

"One!" The finger pressed and the pinnace trembled slightly as a forty-kilo load fell out of the cargo-drop opening.

"Two!" The pinnace trembled again.

"Three!"

Devries slammed open the throttles and jets roared as the pinnace soared upward toward the safety of space. Rockets cut in and acceleration increased. "Wish I could see!" Devries shouted over the racket.

"Iss good stwike!" the female Phuili shouted back. "We see when weach ship. None Silvers alive now!"

Finally the thrust eased and the pinnace began to coast around the curve of the planet toward the distant glint of the big mother ship in its orbit. Devries slackened his seat restraints and turned

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to look back at the passenger. His jaw dropped. "My God."

David said, "You fail, captain."

Beside the old Phuili, a Silver was huddled almost in a ball. He was shivering and his gray fur was damp with sweat. Slowly, he lifted his head from between his lower limbs and stared at the astonished human. Then Silskin showed his fangs in a broad grin.

Jeferson Cranbridge was not surprised when Gia Mayland and Jase Kurber returned to his office. He was feeding papers into a desk shredder. "Come to gloat?" he asked.

"That would be pointless," the slim woman said as she and her husband sat down. "We are here to explain what happened."

"Very thoughtful of you." The former science adviser leaned back into his chair. "All right. Enlighten me."

"From the start, you and your friends were terrified at the possibility of a marriage between the telepathic ability of the whales and the so-called 'instinct' for anti-life of the Silvers. Is that a reasonable statement of your position?"

Cranbridge nodded. "We made no secret of it. As you know, we tried every legitimate means to promote appropriate action."

"To legalize mass murder!" Kurber said angrily.

The older man shrugged. "I did what I believed was necessary at the time."

"Do you still believe that?"

"I can hardly answer that question until I know the subsequent facts. The only firm knowledge I have is to the effect that the raid failed, and that my status here has become somewhat — ah—untenable."

"Serve you damn right," Kurber muttered. He grimaced when his wife punched him in the side. "Sorry, my love. The floor is yours."

She said, "Doctor Cranbridge, it has turned out that the telepathic link between the whales and any Silver is difficult, severely limited, and definitely does not involve control in either direction. What is unexpected however, is that under certain limited conditions a Silver can exert control on another being. It is an extremely painful process for the Silver, and involves a degree of understanding which can never be possible for a sick mind—" Gia Mayland paused.

Cranbridge interpreted the woman's hesitation as a prompt. "Meaning, I suppose, the mind of a wild Silver. All right, so one of your tame cats learned telepathic control. What does that have to do with anything?"

"Only that the whales somehow discerned the latent talent in one of our Project Alchemy products, a Silver named Silskin, and showed him how to use it. Silskin was concealed in the pinnace when it began its bombing run over the settlements on Colony, and managed to control the physical actions of Devries's co-pilot."

Cranbridge frowned. "That would be the Phuili we call Eka. I suppose with Devries at the controls, she would have been the one to drop the charges. So what did this mind-twisting prodigy do? Stop her from dropping them?"

Gia shook her head. "They were dropped. In any case, that involved three consecutive actions and there was

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no way Silskin could have handled all three. He acted before that, when your Phuili was supposed to arm the charges. One small button, which she thought she pressed—''

At first the scientist was incredulous. But after incredulity came his sense of the ridiculous. ''You mean they dropped three duds? No damage?''

''I understand a wall of one hut was caved in and a female Silver received a few cuts and bruises.''

''Well I'll be—'' Cranbridge started to chuckle. The chuckle became laughter and finally hysterical and painful mirth. His two visitors waited patiently until the paroxysm subsided. He wiped the tears from his eyes. ''All right, you two have had your fun. Now go away and leave me to mine.''

''Which is—?'' Kurber asked.

''Disgrace. Exile. I will eat, I suppose. Have a roof over my head. What else is there?''

''You still have your talents. A fine mind. Scientific knowledge.''

''So?''

''We need a permanent team on Colony. To study the planet, the whales, the developing relationship between whales and Silvers. If you want it, there is a place on that team for Jeferson Cranbridge.''

''But I—'' Horrified, he stared at the woman. ''Do I have an alternative?''

''Of course. You just described it. Exile.''

The xenophobe's throat was tight, constricted. He stammered, ''You must give me t—time. Please give mm—me time—''

'The peril is over.'

'Now we can begin.'

'The beings are receptive, but not always willing.'

'So be it. If the final link cannot be joined until the time of generations yet unborn, still we must be glad we are at the beginning. By thought and voice we will sing to our kindred throughout the waters of the Great Mother, so all will know what is past and what is to come.'

'What is past is short. But what is to come—'

'I know. It will be a long song.' ■

●Judging a piece of fiction by the quality of its writing without considering its subject matter is like buying a car because it has a pretty paint job, without considering the state of its engine and transmission.

—Kelvin Throop

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brass tacks

Dear Stan,

"Political Standard Time," in the December issue, was an amusing commentary on the folly of trying to impose conformity without regard to the fact that people react to the world around them. Which is why we have so much controversy over applying daylight savings time, time and again.

I read a proposal in an article by Isaac Asimov in an airline magazine a long time ago that might solve the polls closing issue more satisfactorily. The article was about time zones, and how they came to be adopted over the objection of people who felt that when the sun was directly over *their* town's square was God's Noon, and don't you dare fool with it.

Asimov's proposal was that the time difference between the two coasts was difficult and unreasonable, in today's world of businesses with offices on both sides of the country. He suggested that we combine the two pacific and mountain zones into western time, and the central and eastern zones into eastern time. This would be done by moving each zone one-half hour closer to its companion zone, leaving the western and eastern zones one hour apart. Asimov thought that would be an acceptable difference for business office hours.

If adopted, this would also make other time differences easier to handle, including making the polls open and close together. Of course, this doesn't solve the Alaskan and Hawaiian poll timing, but that doesn't seem to be what the fuss is about.

JOHN T. SOPIENZA, JR.
Washington D.C.

Dear Stan,

I have just finished reading my third edition of *Analog* and I must say: Kudos for an excellent magazine!

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As an avid reader of science fiction, I am astounded (pardon the pun) at the high quality of writing contained therein. I must especially applaud Lois McMaster Bujold (now running neck and neck with Ray Bradbury in my favorites file) for her wonderful serial *Falling Free*. I haven't even read the last installment yet, but already know this is some of the best writing I've been privileged to read.

As an enraptured science fiction writer, I also applaud the fine factual pieces in *Analog*. My techno-file (a blue TARDIS-like box full of 3×5 cards) has already grown much fatter because of the delectable bits of information proffered by such folk as Arthur C. Clarke, G. Harry Stine and yourself.

In particular, I would like to comment briefly on the piece, "On Weaponry," by Mr. Clarke. I, too, find the subject of war more than a little nauseating —hence, history was never one of my favorite subjects until I discovered that it didn't necessarily have to center around greed, strategic forces, politics (cosmic stupidity), and the resulting tallying of casualties. Technoporn, indeed!

Unfortunately, finding a political solution is not as simple as Mr. Clarke suggests. We have tried purely political solutions in the past, which have usually resulted in more wars. The answer lies, not in political solutions, but spiritual ones—solutions that cause us literally to regard the world as one country and mankind as its citizens. Solutions that prompt us to ask, "What is best for us?" and mean the entire planetary population instead of one tiny portion of it (ME!).

I believe that world peace is not only possible, but inevitable. But it will take an "attitude adjustment" of the magnitude our parents tell us we need when we hit fourteen. I'd like to start by presuming to adjust the attitude of Mr. Clarke's closing comment. To wit: ". . . it's very hard to love people who—for excellent reasons—we don't like."

I don't think we can honestly say we don't *like* these people (whoever "they" are). After all, we don't even *know* them. As for the reasons, I'm hardly convinced of their excellence. And therein lies the adjustment: *It's very hard to love people who—for questionable reasons—we don't know.*

Enter, a spiritual solution—one that's been with us since the dawn of time, uttered by every Prophet since Manu. "Do as you would be done by." That is, if you would be understood, seek to understand. If you would enlighten others, seek to enlighten yourself, first. If you would be loved, love.

It is said that ignorance is bliss. In today's world, it could be annihilation. It is said that knowledge is power. In today's world, it could also be life itself.

MAYA K. BOHNHOFF
Grass Valley, CA

Dear Editor:

One implicit assumption in Arthur C. Clarke's "On Weaponry," (Mid-December) seems to be that a big part of the world's population is fixated on weapons of war. Why would Clarke think that?

Suppose a flying saucer lands and forces all the governments on Earth to hold a global election between True Peace (eliminate armed forces forever) and Status Quo (let the armed forces of the world grow in size and lethality). After all persons twenty-one years or older have voted, I am not sure what Clarke would expect, but I am sure Peace would bury Status Quo in a huge landslide.

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Perhaps this is the real problem: Today, of the billions of people on Earth, only a fraction possesses any sort of franchise. The rest have to live under governments that are free to act against the will of their subjects. As Shakespeare's historical plays so often illustrate, such governments are vulnerable to takeover by ruthless persons hungry for power and privilege—just the type of man that Clarke so rightly abhors. I trust he will agree that such persons as Hamlet's uncle and Lady Macbeth would find it well nigh impossible to win elections anywhere except by hoodwinking the electorate or by cunningly exploiting general misery. (Hitler may never have come to power had Germany not been so devastated by World War I, hyperinflation and the Great Depression.) Why may we not await real peace once all our billions of brothers and sisters win universal suffrage?

The surprising movements in South Africa, the U.S.S.R., Red China and other countries to liberalize the government could mean that Mankind has at long last begun to mature, and will in the future turn to beat its swords into plowshares. I doubt that, yet I do hope.

SAM CAMPBELL

Dewey, OK

Dear Dr. Schmidt,

I thoroughly enjoy reading your editorial columns because they are so logical. They challenge me to examine what I believe to see if it is possible to explain my conclusions as well as you do.

I admire your ability to communicate your beliefs, but I have a problem with the way you depict people who are religious or who believe in creation. It seems that you limit yourself to the worst scenario: that of the blind masses accepting what they are told. Many of us who believe in God and creation have no problem with the evidence of evolution, natural selection or other theories of science because we do not limit God. He could easily have taken the millions of years to create this species by putting everything into motion and overseeing its progress, much as we plant and nurture and care for a greenhouse.

I am not suggesting that you accept my belief in God, it requires faith to do this. Not unlike the faith required of you to believe that all this could have come from nothing. (May I add that spontaneous generation was an accepted theory based on available facts at one time?) I do ask that when you present a religious viewpoint you take into consideration that not all your readers are atheistic. Why spend so much time knocking the fundamentalists when most likely none of them would read this magazine?

If you have taken the time to read this far, I am indebted. I look forward to more mental gymnastics of arguing with your future editorials.

KATHLEEN MAXWELL

Monrovia, CA

I have never said or implied that all religious people fit the "worst case scenario," but that's the one that gets the most attention because it's the one that I see as a problem. And it is *a problem appropriately discussed here—it may be that few fundamentalists read this magazine, but some of them have made it clear that they wish to take actions which would* affect *people who do.*

Dear Stan,

After reading the article "Nanotechnology" by Chris Peterson and K. Eric Drexler (Mid-December '87), I came away with mixed emotions. The science of nanotechnology is certainly a promising one, but are we ready for it? No.

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First of all, Ms. Peterson and Mr. Drexler gave me my best argument. The possibility of germ warfare or malice of the man-made bacteria is exactly the reason why we shouldn't expose this to humans as a science for mass usage. Why should parents make their baby, or in our case the Earth, walk before it's ready. A normal "baby" would become bowlegged. Being young, I don't want to grow up in a bowlegged world. When the world is peaceful and people aren't going to abuse science, that's the cue that we're ready. Let's develop our mind before our muscles.

The use of nanotechnology for the building of machines was mentioned before germ warfare. Whenever the topic of advanced machinery comes to my mind, my favorite author follows it. Isaac Asimov wrote many times of world takeovers by machines. I know this is fiction, but many people sometimes forget that it is science fiction. What was considered science fiction twenty or thirty years ago has come true today. So with that in mind, Mr. Asimov's "Bicentennial Man" (1976, Random House) shows the eventual "revolution" of the robots. How many other science fiction stories were written by not only Mr. Asimov, but other writers? Why not hand over the universe to advanced screws and bolts?

My third and final point involves humans as workers. If God wanted us to sit down with a robot running circles around us, He wouldn't have made us as we are. The advantages of nanotechnology only invites man to become weaker and weaker. Why don't people get off their asses, stop claiming they only live on Earth, not run it, and try and do something. Then, and only then will I and many more like me, accept it. It's advantages are certainly obvious, but it shouldn't be rushed because a few people want to see it come true in their generation; not even thinking of mine.

VINCENT DIBARTOLO

East Meadow, NY

One of the big problems associated with nanotechnology is that we may not have as much choice as we'd like in how fast it gets here. As described in Engines of Creation, *the process is likely to be a rapidly self-accelerating one, and those who would rather wait awhile may be forced to deal with the fact that other people are going ahead with it whether they like it or not. The biggest challenge is for civilization to figure out how to cope with both the promises and the threats fast enough to keep ahead of their development. As one worker in the field has said, "The optimistic estimate is that we'll get nanotechnology in thirty years. The pessimistic estimate is that we'll get it in ten."*

Dear Stan,

John F. Carr's "The Last Cavalier: H. Beam Piper," is a splendid piece of primary research, an important document in the study of the field not merely because it presents the facts, but because it shows us what they *mean*. I hope this essay will be reprinted in some permanent reference book so it will be available to future generations of scholars.

Two thoughts occur to me upon finishing it:

First, Piper's death was the true stuff of tragedy, because its cause was within him. He may have been manipulated by events, but in the end it seems that his rigidly individualist philosophy precluded the idea that society exists for the mutual benefit of its members, and that one of the reasons humans have always banded together is to help individuals through tight spots. He seems

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to have literally died for a principle which his own views forced upon him.

Second (and this may be treason in the pages of *Analog*), Carr is wrong when he says that John Campbell seldom misjudged his audience. No, late in his career, Campbell *routinely* did so. That he rejected Piper's most popular and enduring work *(Little Fuzzy)* is hardly surprising when you consider that only one *Analog* story (Poul Anderson's "The Longest Voyage") and one serial *(Dune)* won a Hugo during the entire decade of the 1960s, and that the anthologization rate for *Analog* fiction during this period was the lowest for any of the major magazines. John Campbell apparently also rejected the entire early output of Larry Niven, plus Samuel Delany's *Nova*, and parts of Haldeman's *The Forever War*. He failed to discover or acquire work from virtually all the major writers then active (Zelazny, Le Guin, Cordwainer Smith, Dick, Aldiss—a very long list was published in Brass Tacks by Barry Malzberg years ago), and he even lost many of his best former contributors (Heinlein, Silverberg, Budrys, Wilhelm, Sturgeon, Vance, Leiber—even Doc Smith) to less rigid, if often lower-paying markets.

Let's face it: by 1964 or so, *Analog* was definitely *not* where the action was in science fiction. It didn't come alive again till Ben Bova took over.

So, was H. Beam Piper to some extent a victim of Campbell's ever-narrowing vision?

DARRELL SCHWEITZER

Strafford, PA

Could be—but some of the terminology you use seems a little too simplistic. Was Campbell really misjudging his *audience—or was it just that the audience had become much more diversified than it used to be, and that the part of it that he chose to aim for didn't happen to be the one that was most influential in some circles in that period? It's true that most of the awards were going elsewhere then, but not everyone would accept that as the only valid measure of "where the action was." Ultimately that's a matter of individual taste, as defined in my recent editorial "Matters of Opinion." Tastes differ; that's why we have different magazines (and I wish we had more of them than we do at present). It's true that in Campbell's last years there were many readers who found little that they liked in his magazine, but it's also true that there were others (and even then they were one of the largest single readerships around) who found little that they liked elsewhere. I would not presume to say that* either *group was "wrong" in any objectively meaningful sense.*

Dear Dr. Schmidt:

I don't know whether the yearly AnLab ratings can include such features as the book review column, but I want to say something nice about Tom Easton's reviews. I spent five years as the book review editor of a linguistic journal and have reviewed a good share of books myself, so perhaps my opinion in this matter may carry some weight.

Tom Easton is the best reviewer I have come across. It's not that I always agree with his findings; often enough I do not. Nor is it that he always picks books I am interested in; my wife says I'm far too picky in the books I take home to read, and many of the books Tom reviews are of no interest to me. The nice thing about Tom's reviews is that I can tell immediately from his review whether or not I'm going to like the book in question. It makes no difference whether his opinion of the book is positive or negative and what kinds

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of reasons he gives to justify his view. I never skip or skim his reviews, and he's the only reviewer I can say that about. The simple fact is that his reviews speak to me, inform me, and save me from wasting my time.

In short, whether Tom Easton is up for any AnLab bonuses, I vote him #1 in the features. I would also like to thank him for his work and beg him not to give it up. I don't know how he does it, but it's worth every word to me.

WILLIAM J. SULLIVAN

Gainesville, FL

How refreshing to hear from a reader who understands what reviewers are for!

ON GAMING

(continued from page 99)

pleased with how this particular licensed product turned out.

The cover features a swirling portrait of some interstellar trader done by Frank Kelly Freas (another legend!). The board has a twisting spiral of connected star systems, some featuring such familiar names as Clarke, Bradbury, and Heinlein, while other have names like "Statyk" and "Sanctuary."

As this is a trading game, there is no combat (how refreshing!) and instead players have to haul assorted galactic cargo from one system to another, earning Stellors and Prestige. While gaining wealth is what the game is all about, Prestige is important in order to petition the empire for an Imperial Station. The first player to win an Imperial Station, wins the game.

Traders start the game by selecting personalities. The Navigator helps add to the movement die roll, while the Psychic can look at the next contract card (and try to get his space ship to that star system first). Other personalities add benefits like extra Prestige or the ability to repair engines.

Travel around the spiralling board is done by "jumps." All of the star systems are connected by different colored lines. These lines tell you what you need to roll on a die to successfully make that "jump."

One of the most entertaining parts of the game are the Trader's Luck cards. These can give you the ability to make a superjump (courtesy of a black hole), or stick a banana in your opponent's hyperdrive (and spoil his/her jump). There are also Avoid Calamity cards, and the card play around the table can become quite frantic and funny.

When a Trader's Prestige has risen to an appropriately lofty level, according to a record track on the board, they can roll a die, add their Prestige, and attempt to petition the empire for an Imperial Station. If successful, that will win the game. But an unfortunate, or preemptive roll, could cost all your Stellors and much of your Prestige.

Designed by David Ladyman, and developed by Steve Jackson, *Star Traders* is Interstellar Monopoly, a clever, easy-to-play game.

Just the thing to bring to your beach house and play under the stars, chablis and brie close by . . . ■

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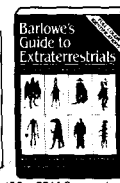

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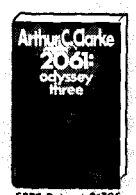

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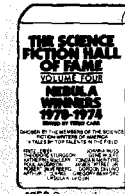

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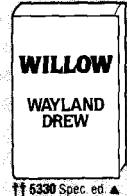

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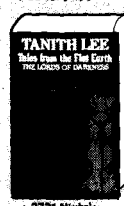

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